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THE MEDICAL JOURNAL OF AUSTRALIA



VOL. I.—14TH YEAR.

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No. 3.

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CHOLECYSTITIS AND ITS COMPLICATIONS.¹

By ALAN NEWTON, M.S. (Melbourne),
F.R.C.S. (England),
*Honorary Assistant Surgeon, Melbourne Hospital,
Lecturer in Surgical Anatomy,
Melbourne University.*

INTRODUCTION.

THE large output of literature on the subject of cholecystitis and its complications is a sufficient indication that there is considerable controversy concerning many aspects of this disease. It is, therefore, opportune that a discussion should take place on what might otherwise be regarded as a trite topic, in order that we may attempt to clarify our views and be "no longer children tossed to and fro and carried about by every wind of doctrine." In this paper an analysis is made of the last hundred and fifty consecutive cases in my practice, amplified in certain respects by a study of the records of the Melbourne Hospital from June, 1920, to June, 1926.

¹ Read at a meeting of the Victorian Branch of the British Medical Association on October 6, 1926.

ANATOMY AND PHYSIOLOGY.

Mann⁽¹⁾ and his colleagues, Belou⁽²⁾, Flint⁽³⁾ and others, have recently published valuable papers on this subject. A study of the comparative anatomy of the biliary passages reveals an extraordinary variability in arrangement of these structures. The gall bladder may be absent or it may be completely dissociated from the bile ducts, in that in some species the cystic duct enters the duodenum by a separate orifice. Both these conditions are occasionally found in man. The typical arrangement of union of the hepatic and cystic ducts to form the common bile duct may be varied, one or more of the hepatic ducts entering the gall bladder, others passing direct to the duodenum. It is unfortunately true that "all attempts to correlate variations in relations of the biliary tract to each other and the presence or absence of the gall bladder to a common factor have failed" (Mann).

There is little knowledge and much supposition regarding the functions of the gall bladder. One which seems to be definitely established is the power of absorption of water and, possibly, of other substances from the bile. There is considerable difference of opinion in regard to other functions such as

the action of the gall bladder as a reservoir for bile, its power of secretion and its value in controlling the pressure in the bile ducts by the elastic recoil of its wall.

The emptying power of the gall bladder is not vigorous. Several investigators have shown that dyes injected into this organ remain therein for some days and more recent work on cholecystography indicates that stasis is a normal condition. Graham⁽⁴⁾ has never observed peristalsis in the gall bladder wall and believes that emptying occurs by a gradual washing out, assisted by the elastic recoil of the organ and movements of the muscles of the abdominal wall. This normal state of stasis and of concentration of the contents of the gall bladder explains the frequency of infection and, moreover, the part played by vigorous action of the abdominal muscles in emptying its contents may account for the increased incidence of infection in those in whom these muscles are weak, namely, in multiparous women, fat people and those who lead a sedentary existence. Removal of the gall bladder is followed by dilatation of the bile ducts and by a decrease in tonicity of the sphincter surrounding the common duct at its orifice, so that the discharge of bile into the duodenum becomes continuous. Fortunately no harmful effect is apparent.

PATHOLOGY.

Infection of the gall bladder is the commonest cause of flatulent dyspepsia. Hurst⁽⁵⁾ believes it is the commonest of all abdominal diseases. Mentzner⁽⁶⁾ at the Mayo Clinic found that, "of six hundred and twelve specimens examined *post mortem*, 62% showed grossly visible disease." Infection may reach the gall bladder by various avenues. It may ascend along the common and cystic ducts from the duodenum or it may descend in the bile from the liver. It may be carried by the blood stream or may pass to the gall bladder from the liver by way of the lymphatics.

The commonest infecting organism is *Bacillus coli*. *Bacillus typhosus* may be present with other organisms or in pure culture, as in a case reported by Andrew⁽⁷⁾ from the Melbourne Hospital. Staphylococci, streptococci, pneumococci and *Bacillus pyocyaneus* are also found. In some cases the culture taken at operation is sterile, indicating that the infecting organism is dead or attenuated.

The macroscopical appearances of infection of the gall bladder vary from a slight redness of the mucous membrane with cholesterol deposits scattered about as yellow dots, forming the so-called strawberry gall bladder, to empyema or necrosis. For the accompanying illustrations of the microscopical appearances found in cholecystitis I am indebted to Mr. Harold Dew, F.R.C.S., and Mr. Henry Searby, F.R.C.S. (see Figures I., II., III., IV., V.).

FORMATION OF GALL STONES.

Though Naunyn still maintains that there are two aetiological factors in the production of gall stones, namely, stasis in the gall bladder and infection of its wall, it is now generally believed that this is not the whole truth, since all infected gall bladders do not produce stones and, conversely, all stones

are not due to antecedent infection. Aschoff⁽⁸⁾ states that, though infection of the gall bladder is the most important cause of gall stones, there are other causes. He divides these stones into three groups: (i.) Metabolic, (ii.) infectious, (iii.) static.

Metabolic stones are divided into pure cholesterol stones and pigment stones; they occur without primary infection in the gall bladder. Pure cholesterol stones occur singly and are due to a disturbance of metabolism producing a transitorily increased excretion of cholesterol by the liver with subsequent precipitation in the gall bladder to form the stone. Another factor involved in the production of these stones may be the amount of bile acids which have some action in holding cholesterol in solution. Aschoff believes that pure cholesterol stones form one-third of all varieties of gall stones. They are not uncommon after pregnancy as a result of the increased cholesterol metabolism which occurs in this condition. Though this single stone at first gives no symptoms, as no infection of the gall bladder is present, sooner or later it becomes impacted in the cystic duct. This accident may produce an empyema of the gall bladder without antecedent signs of cholecystitis (see Case VI.) or, if the stone slips back, a chronic infection may result. This may lead to the secondary development of "infectious" stones upon or beside the original single cholesterol stone. In one case in this series pigment stones were present. The patient suffered from acholuric jaundice and the increased destruction of corpuscles in the spleen caused a large increase in bile pigment which was deposited in the gall bladder as multiple pigment stones. "Infectious" stones are the most common and are composed of cholesterol, pigment and lime salts. They are usually multiple and are the direct result of infection of the gall bladder wall. "Static" stones are differentiated by their situation. They are almost always found in the ducts and are soft, fragile stones developing in the presence of stasis round a foreign body, usually a gall bladder stone which has passed into the ducts.

ANALYSIS OF CASES.

For convenience of description an artificial division of cases has been made in this paper as follows: (i.) Cholecystitis without stones; (ii.) cases in which gall stones were present.

Cholecystitis Without Gall Stones.

Though, doubtless, many cases of cholecystitis disappear spontaneously or are cured by medical treatment, a certain number require surgical intervention, despite the fact that stones have not developed. In this series there are twenty-five cases of cholecystitis without gall stones. In some of these cases the symptoms were so pronounced that a preoperative diagnosis of cholelithiasis was made, but the majority of patients suffered from recurrent attacks of pain which was less severe than that present in gall stone colic. A typical history is as follows:

CASE I.—A female, aged twenty-one years (seen with Dr. Stawell and Dr. Davenport), gave a four years' history of attacks of pain of moderate severity on the right side of

the abdomen, from the costal margin to the right iliac fossa which lasted from one to two days. Corresponding to the area in which the pain was felt, was an area of tenderness and rigidity which persisted for some days after the disappearance of the pain. She also suffered from constant flatulent dyspepsia and occasional sensations of distension in the upper part of the abdomen. One year after the onset of the attacks an appendicectomy was performed through a muscle-splitting incision without relief of the symptoms, except that the pain did not subsequently extend so far down into the iliac fossa. At operation four years after the onset of the disease the gall bladder was found to be adherent to the transverse colon and the duodenum, its wall was thickened and the lymphatic gland in relation to the cystic duct was enlarged. Cholecystectomy was performed. For the last four years since this operation she has led a very active life and has remained perfectly well.

In this case the attacks of pain were merely sufficient to make the patient miserable, but the next case shows that agonizing attacks of pain can occur in the absence of calculi.

CASE II.—A male, aged fifty years (seen with Dr. J. F. Wilkinson), gave a twenty years' history of right-sided abdominal pain, flatulence, upper abdominal distension and attacks of vomiting. Two years ago the appendix was removed through a muscle-splitting incision without the production of any improvement; indeed, the attacks increased in severity and on three occasions were so agonizing that morphine was administered.

On examination during the last severe attack the typical area of tenderness in the gall bladder region was observed. There was no jaundice. The blood cholesterol was 0.225. X ray examination revealed a globular shadow in the gall bladder region. At operation the gall bladder was adherent to the duodenum and its wall was thicker than normal. It was removed and the mucous membrane presented the typical appearance of cholecystitis. Seen recently, two years after cholecystectomy, the patient said that he has been well since operation and regrets that it had not been performed many years before.

Moynihan first pointed out that only temporary improvement followed the operation of cholecystostomy in these cases and that cholecystectomy is necessary to achieve a permanent cure. Two patients in this series had previously undergone an operation in which the gall bladder had been drained and in both the symptoms returned in a few months.

In the following case the gall bladder was drained on two occasions.

CASE III.—A female, aged thirty-five years, gave a typical history of cholecystitis for ten years. Five years ago cholecystostomy was performed with relief of pain for six months. One year later this operation was repeated, but the attacks recurred in three months. I performed a cholecystectomy and found that there was extensive ulceration and papillary development in the mucous membrane. Since this operation two years ago there has been no recurrence of the attacks.

The next case illustrates the fact that a diseased gall bladder may not be recognized by the surgeon because it does not contain stones.

CASE IV.—A male, aged thirty-five years of age (seen with Dr. Stawell), gave a history of attacks of upper abdominal pain and flatulence for fourteen years. Eleven years ago the appendix which was said to be chronically inflamed, was removed through a muscle-splitting incision. One year later incisional hernia, following infection of this wound, was repaired. The attacks continued and four years ago gall stones were diagnosed and the gall bladder was explored. He was informed that adhesions around the gall bladder were divided, but that, as no stones were found, nothing further was done. Two years ago I

removed a typically inflamed gall bladder, since when there has been no return of symptoms.

It is unnecessary to quote further cases to illustrate the fact that inflammation of the gall bladder causes typical attacks of pain in the right upper portion of the abdomen with localized tenderness and rigidity, accompanied by digestive disturbances and deterioration in general health. Though some 50% of my patients had the usual reflected pain in the shoulder region, I have not been impressed, as has Stacy,⁽⁹⁾ by the protean nature of the reflex symptoms produced by cholecystitis. In one case attacks of migraine were present, but cholecystectomy, though producing relief of the coexisting abdominal pain, had no effect upon the headaches.

In some cases of cholecystitis the external appearance of the gall bladder is deceptive. Eighteen of my patients presented evidence of gross infection in that at the operation the wall of the gall bladder was thickened, its normal blue colour was lost and adhesions to neighbouring organs were present. In the other cases there was very little evidence of infection in the external appearance of the gall bladder, though subsequent microscopical examination of its wall revealed definite inflammatory changes. In such cases the surgeon must be guided by the signs and symptoms; if these are definite, cholecystectomy should be performed.

In an early case in this series, Dr. J. F. Wilkinson insisted that I should remove a gall bladder which did not appear strikingly abnormal, because he was convinced by the clinical signs that it was inflamed. Microscopical examination confirmed this belief and there has since been no recurrence of symptoms.

It is probably unnecessary to point out that a continuation of the gastro-hepatic omentum along the inferior surface of the gall bladder, passing thence to the duodenum and transverse colon is a developmental, not a pathological structure. It is known as the cystico-duodeno-colic ligament and is frequently found in cases of visceroptosis. The fact that peristaltic movements in the colon may be transmitted by this ligament to the gall bladder and so cause kinking at the neck of this organ, may account for the increased incidence of cholecystitis in these cases.

It is unfortunately impossible to make an adequate inspection of the mucous membrane of the gall bladder through an opening made at the fundus. Inflammatory changes may be localized to the region near the opening into the cystic duct so that, as Mayo⁽¹⁰⁾ has stated, it would be necessary to make a destructive incision from the fundus to the neck of the gall bladder to be certain that the mucous membrane is healthy. I do not advocate indiscriminate cholecystectomy or regard removal of the gall bladder as a suitable penalty for the crime of belching, but I wish to emphasize the fact that in cases in which he has personally observed a typical attack of cholecystitis, the surgeon should not exonerate the gall bladder because it presents no external evidence of infection. In all these cases an adequate trial of medical treatment should be advised, but, if improvement does not follow, operation should not be unduly delayed. It is to be

hoped that improvement in the methods of medical treatment will obviate the necessity for operation. In this connexion some suggestions recently made by Hurst⁽³⁾ are of interest. The only effective surgical treatment is removal of the gall bladder.

The end results in this series of twenty-five patients are as follows:

Cured	19
Improved	5
Not improved	1
Died	0

Of the five patients classed as improved, two still have obstinate constipation, one gets attacks of mucous colitis, one still suffers from hyperchlorhydria and one has attacks of vomiting without pain. One patient, classified as not improved, still has the same attacks of abdominal pain, but these are more readily controlled by attention to diet.

Cholecystitis With Gall Stones.

The formation of gall stones adds to the symptoms and signs of cholecystitis, if this be present, those due to the mechanical action of the stones. These are briefly acute obstructive cholecystitis, migration of stones to the common duct, ulceration into the duodenum with the attendant risk of gall stone obstruction and the production of carcinoma.

The accompanying Table I. summarizes the conditions found in this series.

TABLE I.—SHOWING CONDITIONS FOUND WHEN GALL STONES WERE PRESENT.

Lesion.	Cases.
Stones in the gall bladder without complications ..	78
Acute obstructive cholecystitis	17
Stones in the common duct	18
Fistula into the duodenum	2
Acute gall stone obstruction of the ileum	1
Acute pancreatitis	1
Carcinoma of the gall bladder	6

The fact that serious complications of cholelithiasis were present in 37% of these cases is a sufficient illustration of the fact that the importance of early operation in this disease is not sufficiently appreciated. Syme⁽¹¹⁾ has emphasized the danger of delay in advising operation when a diagnosis of gall stones has been made and every surgeon with experience of the difficult problems presented by a neglected case will agree fervently with his dictum that "gall stones should be diagnosed in their early stages and always removed by operation once they are diagnosed." I propose first to describe those cases in which various complications were present.

Acute Obstructive Cholecystitis.

Acute obstructive cholecystitis is produced by the impaction of a stone in the cystic duct with the production of acute inflammation in the distended gall bladder which may result in gangrene and perforation. Usually this is a comparatively slow process so that there is time for the development of adhesions which commonly prevent infection of the general peritoneal cavity. It is a late complication of gall stones. Of the seventeen cases in this series

there were only two which occurred in patients under the age of forty. Eleven occurred in the sixth and seventh decades, while one patient was seventy-nine and another eighty years of age. In every case the gall bladder was removed. There were no deaths. In this type of case it is my custom to remove the gall bladder from the fundus towards the cystic duct. Mr. Fred. Bird first taught me how to find a plane of cleavage between the gall bladder and the liver in cases in which acute inflammation is present; this permits the separation of these two structures without much hæmorrhage. If owing to technical difficulties or to the condition of the patient it is deemed wiser to perform a primary cholecystostomy in a case of acute cholecystitis, the surgeon should advise that the gall bladder be removed later. The question of the best time to operate must be decided by consideration of the clinical picture presented by each patient, but as a general rule it is unwise to wait too long in the hope that the inflammation will subside. In old people the anæsthetic employed should be ethylene. Its value is demonstrated by the following case:

CASE V.—A female, aged eighty-one years (seen with Dr. G. L. Lillies), had a typical attack of acute cholecystitis eight months before which gradually subsided. Three days before the symptoms had recurred. The gall bladder was enlarged and very tender on pressure, the temperature was 38.9° C. (102° F.) and the pulse rate 104. There was no jaundice. Dr. Lillies administered ethylene and a gangrenous gall bladder was removed. Despite the fact that there was a large hæmorrhage from an aberrant vein passing into the substance of the liver, the patient made an uninterrupted recovery and has remained well for fifteen months since the operation. I attribute this successful result mainly to the anæsthetic employed.

Another case illustrated the fact that an attack of acute obstructive cholecystitis may be the first indication of the presence of a single cholesterol calculus.

CASE VI.—A female, aged fifty-nine years (seen with Dr. Davenport), a very intelligent woman, said that she had not had the least indication of indigestion or other abdominal discomfort until three days before, when she experienced sudden pain in the gall bladder region. She presented the typical signs of an acute cholecystitis. The gall bladder was removed. It contained a single cholesterol calculus which had occluded the cystic duct.

Stone in the Common and Hepatic Ducts.

There were eighteen cases in this series with two deaths. Stones were found in the ducts unexpectedly in two cases in which there had not been the usual history of attacks of intermittent colic and jaundice. In two cases persistent jaundice was present and in these an impacted stone was removed from the ampulla by a transduodenal route. In one of these cases a preoperative diagnosis of carcinoma of the head of the pancreas had been made. In six cases the presence of suppurative cholangitis was manifested by rigors, high temperature and intermittent jaundice. In fourteen cases the gall bladder was removed; cholecystostomy was performed in four because of the presence of jaundice at the time of operation. The increased risk of hæmorrhage from the gall bladder fossa of the liver in such circumstances is well known.

Fistula Between Gall Bladder and Duodenum.

Fistula between the gall bladder and the duodenum was present in three cases, in one of which an acute obstruction of the ileum was produced by a gall stone. In these cases there was a long history of gall bladder disease with intermittent attacks of pain which had recently become continuous. This continuous pain is a sign of evil omen and invariably indicates the onset of some serious complication. In the case in which an acute obstruction was present, the stone was removed from the ileum, but the patient refused to permit a second operation upon the gall bladder. In the other two cases the duodenal fistula was closed. Even when there are no signs of obstruction it is wise to make a search for a stone which may have escaped into the small intestine. This was demonstrated by one case in which a stone was removed from the upper part of the jejunum before it had obstructed the bowel. The second case is given in some detail for it illustrates the many difficulties which may confront the surgeon in old standing cases of gall stones.

CASE VII.—A female (seen with Dr. Stawell and Dr. Wilkinson) had attacks of biliary colic and jaundice for four years. Soon after the onset of these attacks an acutely inflamed appendix was removed through a muscle splitting incision. At this operation dense adhesions in the gall bladder region were found and the surgeon advised early operation on this organ. For various reasons this was delayed for three years. In the meantime the attacks of colic had continued and latterly the pain had become continuous and was accompanied by severe attacks of vomiting. The usual gall bladder incision was made through a fat abdominal wall. The liver was small and tough and its lower border was five centimetres (two inches) above the costal margin. It could not be drawn down into the wound because it was fixed to the diaphragm by adhesions on its upper surface. The gall bladder was small, densely adherent to the transverse colon and the duodenum and contained several large stones. When the adhesions were separated, a fistulous opening into the duodenum was found. This was closed and the greater part of the gall bladder was removed. After a stormy convalescence complicated by an obstruction of the small intestine by a band of adhesions, she recovered and remained well for five months. She then had a recurrence of severe vomiting which resisted all forms of medical treatment. The abdomen was reopened and an extensive carcinoma was found in the liver. It had apparently originated in the gall bladder region. She died soon after this operation. The portion of the gall bladder which was removed at the first operation, was not examined microscopically, but did not appear carcinomatous. It seems probable that the growth began in the small portion of the gall bladder which I was unable to remove.

It does not require many such cases to convince the surgeon of the necessity for early operation in gall stones.

Gall Stones Associated with Acute Pancreatitis.

There were two cases of gall stones associated with acute pancreatitis with one death. In neither was there any evidence of acute inflammation of the gall bladder. In the patient who recovered, the gall bladder was drained after removal of the stones in addition to the usual incision and drainage of the pancreas. The second patient was a girl, aged sixteen years. Owing to the severity of the symptoms I did not remove the stones. She died in three days. I think that she would have had a better

chance of recovery had I drained the gall bladder. I have not been impressed by the frequency of chronic pancreatitis of a degree which can be demonstrated at the operation, in this series. In only two cases was there obvious increase in density of the pancreas. In one the gall bladder was drained so that it might be used later for anastomosis if necessary; in the other the stones were removed and a cholecyst-gastrostomy performed.

Carcinoma of the Gall Bladder and Bile Ducts.

The incidence of malignant disease in this series was 4.6% and 4.2% in five hundred patients with gall bladder conditions treated at the Melbourne Hospital.

Walton⁽¹²⁾ states that eighteen of a total of four hundred and nine patients at the London Hospital had carcinoma. He quotes Slade who found carcinoma present in 56% of a small series of thirty-three patients with calculi, Hale, White and Ticehurst who found forty-five carcinomata in three hundred and thirty-three patients at Guy's Hospital and Riedel who estimates the frequency at 8%. Though the close association of carcinoma and gall stones is emphasized by many writers, stones were absent in eight of twenty-one patients treated at the Melbourne Hospital. Stones were found in six of my seven patients.

In the Melbourne Hospital series the gall bladder was primarily involved in sixteen cases and the ducts in five.

Other clinical findings were as follows:

Palpable tumour	11 cases
Jaundice	13 cases
Liver secondaries	15 cases
Local abscess	2 cases
Peritonitis	1 case
Gall stone colic	12 cases

Recurrence is the rule after operation on these conditions and the only method of decreasing the incidence of carcinoma is to practice the routine removal of infected gall bladders. In the following case a carcinoma was discovered unexpectedly at an early stage, cholecystectomy was performed and yet the patient died of extensive recurrences in the liver one year later.

CASE VIII.—A female, aged thirty-nine years, gave a ten years' history of flatulent dyspepsia and of continuous upper abdominal pain for three months. At operation the gall bladder contained no stones, but, as the wall was thicker than normal, it was removed. There was definite papillary formation of the mucous membrane (see Figure VI.). Microscopical examination revealed an early carcinoma. Death occurred one year later from secondary growths in the liver.

Cholecystectomy versus Cholecystostomy.

Impressed by the fact that fifteen patients in this series had undergone previous operations for drainage of the gall bladder, I investigated the case histories at the Melbourne Hospital for the last six years. The total number of admissions was five hundred and twenty-one. Cholecystostomy was performed in two hundred and forty-six cases and cholecystectomy in two hundred and seventy-five.

Table II. indicates the admissions during this period to the Melbourne Hospital after cholecystectomy performed at this or other hospitals and the condition found on examination. The figures refer to individual patients, not the number of readmissions. The latter figure would be misleading as some patients were admitted several times.

TABLE II.—SHOWING RECURRENCES AFTER CHOLECYSTECTOMY.

Nature of Recurrence.	Number of Patients.
Recurrence of stones in gall bladder	22
Recurrence in gall bladder and in common duct	6
Stones in common duct only	3
Recurrence of symptoms—infected gall bladder removed—no stones found	6
Abscess round gall bladder drained—biliary tract not investigated	2
General peritonitis caused by rupture of gall bladder	1
Division of adhesions—no operation on biliary tract	4
Discharge of bile, pus and stones through scar—no operation	2
Vomiting of bile pus and stones—operation refused	1
Biliary fistula—no operation	2
Recurrence of colic—operation refused	4
TOTAL	53

The mortality in this group was high. Of forty-one patients submitted to operation seven died, a death rate of 18.7%. There were three deaths from postoperative hæmorrhage, one from general peritonitis and three shortly after operation from unspecified causes.

During the same period there were six patients readmitted after cholecystectomy. The condition of these patients is analysed in Table III.

TABLE III.—SHOWING RECURRENCES IN SIX PATIENTS READMITTED AFTER CHOLECYSTECTOMY.

Nature of Recurrence.	Number of Patients.
Recurrence of stone in common duct. Three readmissions. Death from cholangitis	1
Stenosis of common duct after cholecystectomy at another hospital. Many readmissions. Death from cholangitis	1
Recurrence of pain. Operation—no stones discovered—division of adhesions	2
Recurrence of pain eight years after cholecystectomy. Diagnosis broncho-pneumonia	1
Recurrence of pain. Diagnosis chronic pancreatitis. No operation	1
TOTAL	6

Of these recurrences two were due to errors of technique at the first operation in that a stone in the common duct was overlooked in one case and in another a portion of the common duct was removed with the gall bladder. These two patients died after several readmissions and operations. One other died after a prolonged search for a non-existent stone. In this case the recurrence of pain was due to adhesions, a condition which will be discussed later.

These figures support the belief that there is a much greater prospect of recurrence after chole-

cystostomy than after cholecystectomy and confirm figures published by other surgeons. Sherren,⁽¹³⁾ for example, gives the following figures from his practice:

Cholecystectomy 184 cases, 6 deaths, 0 recurrences
Cholecystostomy 152 cases, 4 deaths, 29 recurrences

It is ridiculous to assert that cholecystectomy should be performed in every case; the surgeon must use his own judgement, but should be able to justify his action when he drains the gall bladder.

In my series the gall bladder was drained in eleven cases and removed in one hundred and thirty-three.

Of the eleven patients treated by cholecystostomy, severe jaundice was present in four. Reference has already been made to the risk of cholecystectomy under these circumstances. In one case acute pancreatitis was present. In one case there was definite induration of the head of the pancreas and the gall bladder was not removed, because it might be required later for anastomosis with the gut to overcome obstruction. In one case complicated by heart failure and in another by pulmonary tuberculosis, removal of the gall bladder would have been a difficult operation. I did not feel justified in subjecting these patients to this increased risk. In Case VII. (described above) I was not able to remove the gall bladder completely. In the two remaining cases I cannot find any explanation in the history to account for the operation of cholecystostomy.

End Results.

In my series there were six deaths, a mortality of 4%. Every case in which gall stones were found at operation is included, though in two no operation was performed on the biliary tract.

The following is a summary of the condition found and the cause of death in each case:

1. A male, aged seventy-one years, suffered from diabetes. A stone was found in the common duct. Cholangitis was present as well as aortic regurgitation. Ethylene anaesthesia was used. A drain was inserted in gall bladder and duct. Parotitis occurred with liver failure. Death took place seven days after operation.

2. A male, aged seventy-two years, suffered from heart failure and biliary colic. Gas and oxygen anaesthesia were used. Cholecystostomy was performed with removal of small stones. Death took place three weeks later from heart failure.

3. A female, aged sixty-seven years, was subjected to cholecystectomy for uncomplicated cholelithiasis. Death occurred from pyelitis five weeks after operation.

4. A male was admitted moribund from peritonitis due to rupture of a gall bladder which had previously been drained. The abdomen was drained. No operation was performed on the biliary tract. Death occurred twelve hours later.

5. A female, aged sixteen years suffered from acute pancreatitis. Stones were palpated in the gall bladder. No evidence of acute infection was found. The pancreas was drained. Stones were not removed. Death took place in four days.

6. A female, aged fifty-six years, was operated on. A stone in the common duct was overlooked. This blocked the tube and caused death from peritonitis.

The last case was a surgical tragedy. I think that the stone must have been in the hepatic duct, whence it passed into the lumen of the tube in the common duct producing a complete obstruction of the tube and consequent escape of infected bile into the peritoneal cavity.

Recurrence of Symptoms After Operation. *After Cholecystostomy.*

Recurrence has taken place in the patient whose gall bladder condition is complicated by pulmonary tuberculosis. The latter disease has progressed to a stage which forbids further operation.

I should like also to mention two patients, not included in this series, whose gall bladders I drained twelve years ago, in both of whom recurrence occurred. In another patient I overlooked small stones in the gall bladder which were subsequently removed by Mr. Zwar.

After Cholecystectomy.

Every surgeon is familiar with the fact that attacks of pain, resembling gall stone colic, recur after cholecystectomy in some cases. I have traced eighty-six of my cholecystectomy patients and have found that eight have had recurrence of symptoms. In two of these attacks of colic with jaundice are present. In both instances stones in the common duct were removed at the first operation and it is probable that recurrence of stones has caused the pain. In the other six attacks of pain without jaundice have recurred. These attacks may be due to adhesions as in the following case.

CASE IX.—A female, aged thirty-nine years, suffered from severe recurrent attacks of colic four weeks after removal of an infected gall bladder which contained many stones. At a second operation it was found that the greater curvature of the stomach had become adherent to the stump of the cystic duct. The adhesions were divided and the stump of the duct covered with peritoneum. The attacks have not recurred.

In three other cases there have been similar attacks of less severe pain which are probably due to adhesions. The precise action of these adhesions is obscure. It is possible that they cause spasm of the pylorus or the sphincter of the common duct. That the latter condition may give pain is illustrated by the following history of a patient who was admitted to the Melbourne Hospital under the care of Mr. Harold Dew.

A male, aged forty years, suffered from recurrence of severe attacks of pain after cholecystectomy. Numerous adhesions around the pylorus and common duct were divided without relief of pain. No stones could be felt in the common duct. As the attacks persisted, the abdomen was reopened. At this operation an incision was made into the common duct. No stones were found. The duodenal orifice of the common duct was dilated with complete relief of the attacks of pain.

In the fifth case in my series in which calculous cholecystitis was associated with hyperchlorhydria, attacks of pain recurred, but the patient's symptoms were relieved by changing the preparation of bismuth in the alkaline powder which had been ordered for her. The sixth patient can avoid attacks of pain by scrupulous attention to diet.

It is obvious that there are many possible causes for these recurrent attacks of pain after cholecystectomy. In some cases medical and dietetic treatment will relieve the symptoms. In others a second operation is necessary to remove stones from the common duct, to divide adhesions or to dilate the orifice of the common duct. In two cases not included in this series I found that the persistence of symptoms was due to chronic pyloric ulcers which had been overlooked at a previous operation for cholecystectomy.

Diagnosis.

In this series there were the usual number of mistakes in the differential diagnosis of ulcer near the pylorus, appendicitis and cholecystitis. In two patients all three conditions were found. As these structures can be exposed by one incision, such mistakes are not of great importance.

X Ray Diagnosis.

X ray diagnosis was accurate in 75% of my cases. Direct findings, such as stone shadows or a definite shadow of the gall bladder, are obviously diagnostic. The most valuable indirect finding has been deformation of the second part of the duodenum. Of less importance are deformations of the stomach and hepatic flexure. My short experience of cholecystography has impressed me with the value of this method. I am indebted to Dr. Hewlett for the accompanying X ray pictures. In two a normal gall bladder shadow is apparent (see Figures VII. and VIII.). In Figure IX. no gall bladder shadow is seen, but there is a shadow resembling a stone impacted in the cystic duct. I confirmed this X ray diagnosis at operation. It is important to take a plate of the gall bladder region before administration of the drug, for a pathological shadow due to a diseased gall bladder may be mistaken for one produced by the dye. Mayo sounds a note of warning in respect to cholecystography when he states that "it is important that the clinical findings should not be overborne by a normal appearing shadow of the gall bladder."

Estimation of Blood Cholesterol.

Moynihan⁽¹⁵⁾ has quoted results obtained by Dr. J. R. Bell and Dr. Shiskin which indicate the importance of an increase of cholesterol in the blood in the diagnosis of gall stones. Campbell,⁽¹⁴⁾ on the other hand, is in complete disagreement with these findings. He has found that the amount of cholesterol in the blood in the presence of gall stones is within normal limits.

Operative Methods.

In eighteen cases in this series the appendix had been removed through a muscle splitting incision and the patients had been informed that it presented the appearances of chronic inflammation. The history of these patients indicated that the gall bladder was diseased at the time the appendix was removed and very little benefit accrued from the appendicectomy. It is bad surgery to remove a chronically inflamed appendix through an incision

which does not permit of adequate abdominal exploration. It is impossible to explore the gall bladder region through a muscle splitting incision in the right iliac fossa. Though I have made this mistake in the past, it is now my practice to make an epigastric incision, reflecting the rectus outwards in all cases in which there is any doubt regarding the part played by the appendix in the production of the symptoms. This incision does not leave the abdominal wall any weaker than a muscle splitting incision and permits proper investigation of all the abdominal organs. It is unnecessary to emphasize the importance of a routine examination of the abdomen in every case. Even when the pathological changes in the gall bladder are apparently sufficient to explain the symptoms, other lesions may be found. In two cases in my practice stones had been removed from the gall bladder at an operation elsewhere but small chronic pyloric ulcers had been overlooked. It is often possible to combine the proper, surgical treatment of the gall bladder region with that demanded by any other disease which may be discovered. Table IV. gives the details of cases in which multiple operations were done at one stage.

All these patients recovered. It is my routine to remove the appendix in cases of gall bladder disease and this operation was performed in all the cases in Table IV. with the exception of cases 1 and 2.

Many different incisions have been advocated by various surgeons for operations on the biliary tract. The ideal incision should combine adequate exposure with a minimum amount of damage to the abdominal wall. Though no incision is necessarily



FIGURE XI.

Exposure of field for cholecystectomy, showing forceps applied to Hartmann's pouch for traction of gall bladder and retractor, lamp and pump in position.

the best for every case, there is no doubt that a paramedian incision with reflection outwards of the rectus muscle best fulfils both these requirements. In this incision it is necessary to separate two tendinous intersections of the rectus muscle from the sheath (see Figure X.). It is wise to make the incision in the posterior sheath slightly shorter than that in the anterior sheath to facilitate subsequent suturing.

I find Devine's retractor is of the greatest value in these operations, but I have modified it slightly in that I use malleable copper retractors which can be bent to the desired shape. Cameron's light is of value in difficult cases. Both the lamp and the connecting cord can be sterilized by boiling. A suction pump is introduced into the lower end of the incision to remove any blood or bile which may escape. The exposure of the field is seen in Figure XI.

It is undesirable to apply traction to the liver. I have seen a portion of the liver torn off by an assistant in his anxiety to make the task of the surgeon lighter. A forceps applied to the gall bladder in the region of Hartmann's pouch is usually sufficient for purposes of traction.

It is my practice to drain the abdomen after cholecystectomy, but in order to

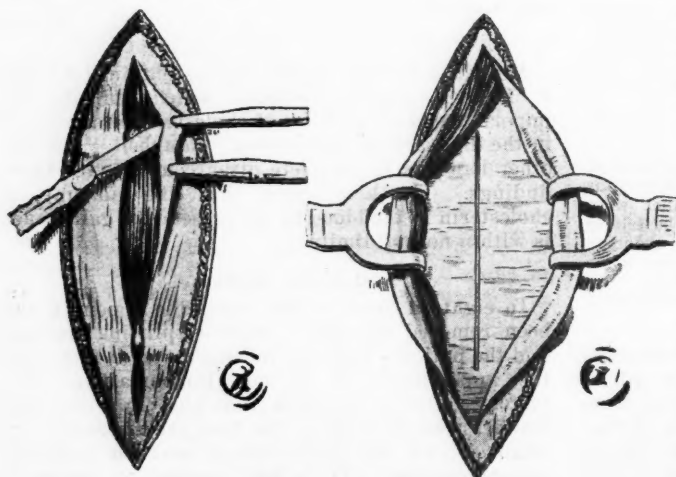


FIGURE X.

Showing method of reflection of rectus muscle.

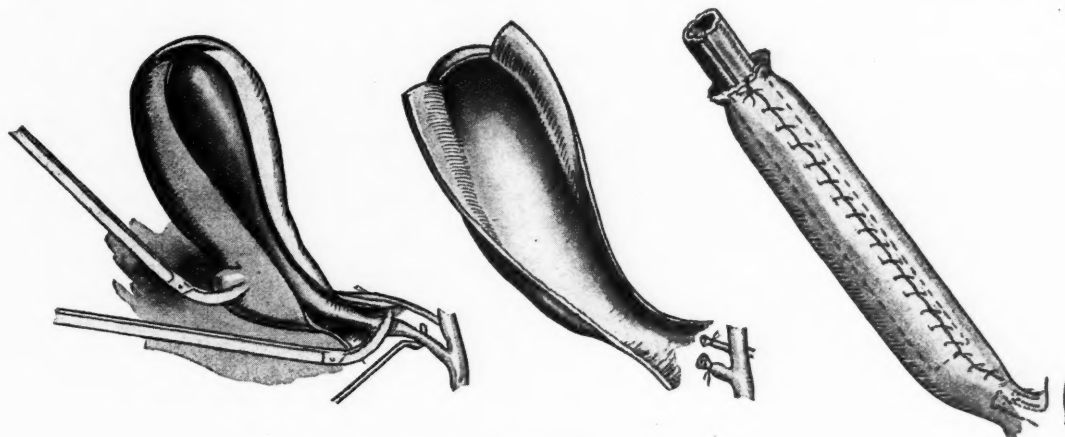


FIGURE XII.
Reflection of large peritoneal flaps from gall bladder and subsequent suture over stump of cystic duct and drain tube.

avoid adhesions I usually place the drain next the bare area of the liver in the gall bladder fossa and suture over it peritoneal flaps previously reflected from the gall bladder. The drain tube is thus mainly extraperitoneal (see Figure XII.). The drain tube passes through a small opening in the rectus muscle except in cases in which the gall bladder is lying more to the right than usual, when a separate button-hole opening is made through the abdominal wall (see Figure XIII.). The wound is sutured by interrupted stitches, a much safer method than a continuous suture. In an uncomplicated case the tube is removed in forty-eight hours. In some cases there

is an unexpected discharge of bile from the tube, due probably to injury to an accessory duct which has not been detected at the operation. This must occasionally give rise to trouble when drainage has not been used.

It is not my practice to open the common duct unless I can palpate a stone in it. If there are many adhesions it is often easier to open the common duct posteriorly. When the common duct has been opened for the removal of stones, digital exploration of the lumen is most satisfactory. If the duct is not sufficiently dilated to admit the finger, the best probe is a rubber catheter. Cushing first showed the usefulness of this instrument in finding fragments of indurated bone in brain wounds. A curious grating feeling is transmitted up the catheter. The same sensation is produced by contact with a stone in the common duct.

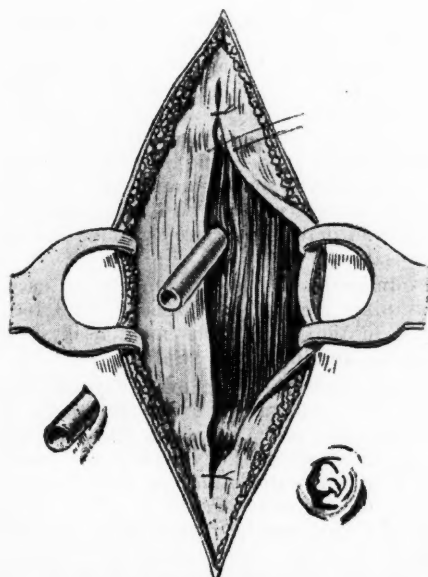


FIGURE XIII.
Closure of wound with drain through rectus muscle or separate buttonhole incision.

TABLE IV.—SHOWING MULTIPLE OPERATIONS DONE AT ONE STAGE.

Lesion.	Operations.
1. Hæmolytic Jaundice	Splenectomy; Cholecystectomy (pigment stones).
2. Cholelithiasis; sarcoma of stomach	Cholecystectomy; removal of sarcoma.
3. Cholelithiasis and incisional hernia in hypogastrium	Cholecystectomy; repair of hernia.
4. Cholelithiasis and uterine myoma	Cholecystectomy; hysterectomy.
5. Cholelithiasis and hepatic hydatid	Cholecystectomy and removal of hydatid cyst without drain.
6. Cholelithiasis and duodenal ulcer	Cholecystectomy; posterior gastro-enterostomy.
7. Cholelithiasis and uterine prolapse	Perineorrhaphy; colporrhaphy; ventrofixation; cholecystectomy.
8. Cholelithiasis; duodenal ulcer; uterine displacement	Curettage of the uterus; ventrosuspension; cholecystectomy; pyloroplasty.

In two cases an impacted stone in the ampulla was removed by a transduodenal route. In one case a tube was introduced down the duct into the duodenum to permit of the introduction of nutrient

fluids. In the remaining cases of stone in the common duct a small catheter was sutured into the opening of the duct and removed in five to seven days.

After Treatment.

I must emphasize the necessity of careful medical treatment after operation in these cases. The infection of the gall bladder is often associated with a secondary disturbance of the stomach, pancreas and other organs which do not disappear immediately after removal of the cause.

CONCLUSIONS.

1. Further investigation of the comparative anatomy and the physiology of the gall bladder is necessary to determine the functions of this organ.

2. It is important to recognize the occurrence of cholecystitis without stone formation and in some cases without much external evidence of gall bladder disease. These patients, if there is no improvement after medical treatment, should be treated by cholecystectomy.

3. The fact that complications had occurred in 37% of gall stone cases is an indication that the importance of early operation is not sufficiently recognized.

4. The increased incidence of recurrence after cholecystostomy is shown by the Melbourne Hospital figures.

5. Attacks of pain of a spasmodic type are not uncommon after cholecystectomy. In some cases these can be cured by medical treatment, but in others a second operation is necessary. The cause of these recurrences merits further investigation.

6. The incidence of malignant disease was 4.5%.

7. The best incision is by reflection of the rectus muscle; drainage should be adopted in all cases of cholecystectomy; the drain should be as far as possible extraperitoneal.

I trust that a study of the cases and figures upon which these conclusions are based will absolve me from the charge of being the careless advocate of ill-considered opinions.

ACKNOWLEDGMENTS.

I am indebted to Dr. Wright Smith, surgical registrar at the Melbourne Hospital, for his help in investigating the case histories of carcinoma of the gall bladder and to Miss Maudsley, of the Walter and Eliza Hall Research Institute, for the microphotographs.

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CHOLECYSTOGRAPHY.

By J. G. EDWARDS, M.B., Ch.M.,
Honorary Radiologist, Sydney Hospital.

DURING the past year much work has been carried out by radiologists in the investigation of diseases of the gall bladder by what is known as Graham's method. Certain drugs particularly sodium tetrabromophenolphthalein and sodium tetraiodophenolphthalein are excreted by the liver and stored in the gall bladder with the bile. When a radiogram of such a gall bladder is taken definite shadows are cast on the film. Dr. Graham first used the bromine salt, but Dr. Whitaker and Dr. Millaken, of Boston, suggested the use of the iodine salt, as it has twice the specific gravity of the bromine salt and so only half the quantity is necessary for a dose. Moreover as both salts have equal toxic qualities, weight for weight, the liability to disturbance is less with the iodine salt. We therefore find that the sodium tetraiodophenolphthalein is almost universally used. The drug may be administered either intravenously or by mouth. The intravenous method is more accurate, but this method is not practicable in private practice and must be reserved for hospital use.

Oral administration is safe and can be used without confining the patient to bed. The technique employed in the intravenous method is similar to that used in administering "Salvarsan."

For individuals weighing over fifty-six kilograms (one hundred and twenty-five pounds) the dosage of the iodine salt is 3.5 grammes dissolved in thirty cubic centimetres to forty cubic centimetres of freshly distilled water (that is about 0.4 gramme per kilogram of body weight). The solution is filtered and sterilized by fifteen minutes' boiling in a water bath.

The gravity apparatus is used and the solution introduced into the median-basilic vein, great care being taken to prevent the escape of any of the

ILLUSTRATIONS TO THE ARTICLE BY MR. ALAN NEWTON.



FIGURE I.
Acute Cholecystitis. General Hyperæmia, Leucocytic Infiltration of the Wall and General Cellular Reaction. There is as yet no shedding of epithelium, but there is some exudate on the mucous surface.



FIGURE II.
Strawberry Gall Bladder. Chronic Hyperæmia with Distension of Submucous and Subserous Vessels. Deposit of Cholesterol in the Villi. Some Epithelial Shedding between the Villi. Mucous Membrane Red with Yellow Dots.



FIGURE III.
Granulation Tissue Developing in the Gall Bladder Wall. Organization of this Tissue, Multiplication of Mucous Glands.

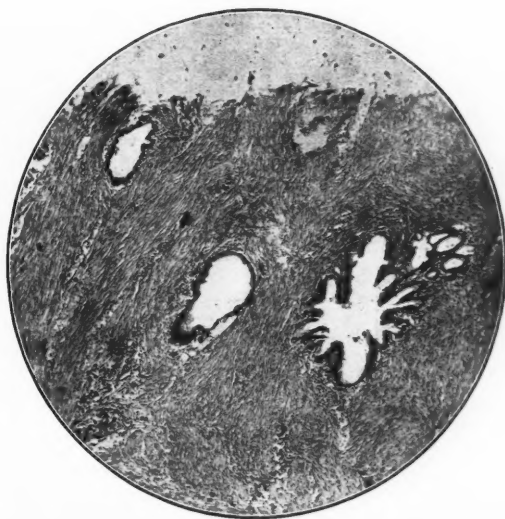


FIGURE IV.
Chronic Cholecystitis. Fibrosis of the Wall and Mucous Retention Cysts from Isolated Tubules of the Mucous Glands.

ILLUSTRATIONS TO THE ARTICLE BY MR. ALAN NEWTON.



FIGURE V.
Chronic Cholecystitis. Almost Total Replacement of the Muscle in the Wall by Fibrous Tissue.



FIGURE VI.
Gall Bladder Opened, Showing Early Carcinoma of the Mucous Membrane.



FIGURE VII.
Normal Gall Bladder Shadow Twelve Hours After Oral Administration of "Kerosal" (Dr. H. M. Hewlett).

ILLUSTRATIONS TO THE ARTICLE BY MR. ALAN NEWTON.



FIGURE VIII.
Normal Gall Bladder Shadow Superimposed on
Renal Shadow (Dr. H. M. Hewlett).



FIGURE IX.
No Gall Bladder Shadow After Administration of
"Kerosal." Shadow of Stone Impacted in Cystic
Duct. Confirmed at Operation.

ILLUSTRATIONS TO THE ARTICLE BY DR. J. G. EDWARDS.



FIGURE I.
Showing Gall Bladder not Filled. Blockage of
Cystic Duct. Note three undissolved pills.



FIGURE II.
Showing Large Distended Gall Bladder Filled
with Dye.

ILLUSTRATIONS TO THE ARTICLE BY DR. J. G. EDWARDS.



FIGURE III.
Showing Gall Bladder only Partly Filled with Dye. Note one calculus at the upper end which caused intermittent duct blockage and also a collection of calculi in the fundus.



FIGURE IV.
Showing Small Contracted Gall Bladder containing Dye.

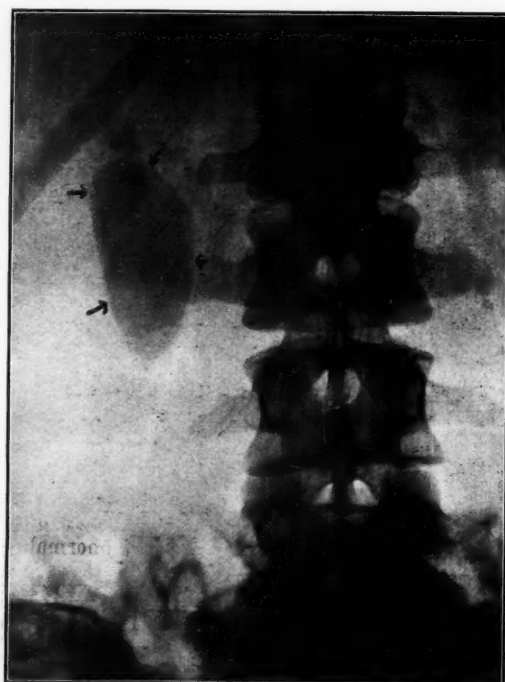


FIGURE V.
Showing Gall Bladder Filled with Dye and with Darker Shadows near the Cystic Duct due to Gall Stones.

solution into the subcutaneous tissues; such an escape leads to painful sloughing.

The secret of success in making this injection is to make it very slowly and if fifteen to twenty minutes are taken over the injection, no ill effects are produced. A too rapid injection is followed by an alarming collapse, but this may be counteracted by giving a subcutaneous injection of adrenalin chloride.

No food should be taken for four hours before injection nor for about ten hours after injection.

Nausea may be complained of, but this can be relieved by the drinking of copious draughts of water containing small quantities of sodium bicarbonate.

Oral administration is a simpler method.

The sodium tetraiodophenolphthalein is administered in "enteric-coated" pills, that is, pills coated with a material which resists gastric digestion but which breaks down in the intestine. A proprietary pill, made by a Boston firm, called "Piliophen," is used and each pill contains 0.3 gramme of the salt and one pill is given for each 5.5 kilograms of weight. The patient should have the bowel well opened on the day previous to the operation by a mild laxative and enemata. A light evening meal without meat is taken at 6 p.m. and commencing at 8 p.m. four pills are taken every half-hour until all are consumed. Copious draughts of water are allowed and if nausea is complained of, sodium bicarbonate may be added to the water. No food is allowed until after the first X ray examination at 9.30 a.m. the following day.

The patient must be warned against breaking the pills and no aperient is to be taken on the day of examination.

The first radiogram is taken at 9.30 a.m. and the patient rests for a couple of hours and then another is taken. If the gall bladder shadow is well defined, a meal containing fat is allowed and if the gall bladder retains its elasticity it should be found empty after this meal.

In cases of cholecystitis and in cases of cystic duct blockage it will be found that none of the dye enters the gall bladder. When gall stones are present, the gall bladder shadow frequently has a mottled appearance and the translucent gall stones show as dark or "negative" shadows in the radiogram with the dye shadow between their facets.

Great care is necessary in interpretation as a collection of the dye in the hepatic flexure is confusing, while kidney stone shadows and calcifications of the rib cartilages are very deceptive.

Direct antero-posterior and oblique skiagrams are usually taken through the gall bladder region and thus it is possible to exclude many of the confusing shadows seen.

The administration of an opaque meal in addition is also of great value in the investigation of gall bladder conditions, as by its means abnormal conditions of and adhesions to the stomach and duodenum and to the colon may be demonstrated.

Illustrations accompanying this paper indicate some of the appearances met with in this class of work.

PARAGONIMIASIS: ITS FIRST RECORDED OCCURRENCE IN THE TERRITORY OF NEW GUINEA.¹

By R. W. CILENTO, M.D., B.S., D.T.M. & H.,
Director of Public Health;

AND

T. C. BACKHOUSE, M.B., B.S., D.P.H.,
*Bacteriologist, Commonwealth Health Laboratory,
Rabaul, New Britain.*

THE discovery in a native of New Britain, Mandated Territory of New Guinea, in circumstances indicating local endemicity, of a trematode parasite which in other countries causes grave effects over wide areas, is a matter of considerable interest and concern.

In 1919 one of us (R.W.C.) while stationed at Kavieng, observed appearances suggestive of paragonimiasis in the lung of a labourer dead of pneumonia. As this incident occurred during the first days of a violent epidemic of respiratory disease which destroyed 3% of the population, on a day on which several natives died at the small local hospital and several hundred natives reported "sick," the specimens were in the general confusion thrown out by the native morgue attendant.

The subject was not lost sight of, however, during a five years' absence from the Territory and reference to the possibilities in this regard was made in 1923.⁽¹⁾ When in 1925 circumstances permitted a return to New Guinea in the capacity of Director of Public Health with adequate laboratory facilities, the question of paragonimiasis was listed among many others for early investigation.

The actual case here reported, however, was unsought and unsuspected and was discovered in the *post mortem* room during the routine examination which is made of all natives dying in the Rabaul Native Hospital.

On August 13, 1926, one of us (T.C.B.) was called to perform a *post mortem* examination on a male native who had died after amputation undertaken for chronic ulcer of the leg.

The case notes which have been handed in by the surgeon in charge of the patient (Dr. H. Champion Hosking), are to the following effect:

The patient was admitted to hospital on July 15, 1926, with a large ulcer on the inner side of the left leg. The upper portion of the ulcer about 2.5 centimetres by 2.5 centimetres (one inch by one inch) in extent, was a sub-acute excavated ulcer with a relatively healthy margin and a pink, granulating base. The lower portion had a diameter of 3.75 centimetres (one and a half inches) and was filled with a black, gangrenous slough. Apparently this was due to an acute attack on an older ulcer. There was a subsequent history of failure to respond to treatment and extension by burrowing up the leg. On August 12, 1926, amputation of the thigh was performed and death occurred on the same day.

The report of the bacteriologist (T. C. Backhouse) was to the following effect:

External examination revealed no extensive emaciation. No skin eruptions, localized swelling or edema were present. On the recent amputation stump of the left thigh, clean, opposed flaps were seen without suppuration. *Rigor mortis* was present.

¹ Received for publication October 27, 1926.

On internal examination the pleural cavity was found to be completely obliterated by dense, but not very old adhesions. The lung weighed 390 grammes (thirteen ounces). It was not palpably consolidated, no scars or nodules at apex or other signs of old or recent tuber-



FIGURE I.

Paragonimus? westermanni; actual size. Alcohol specimen, fixed without relaxation. Length = 6 mm.; breadth = 4.5 mm.; thickness = 3 mm. A = dorsal view; B = ventral view; C = lateral view.

culosis were seen. On section the lung was found to be somewhat congested and oedematous, but no consolidation was present. Some bronchioles contained muco-purulent plugs. The bronchial glands were enlarged and darkly pigmented; no caseous foci were seen. The left pleural cavity was obliterated by adhesions. The lung weighed 441 grammes (fourteen and three-quarter ounces). A small, palpable nodule was present in the lower lobe. No scars or signs of tuberculosis were found at the apex or elsewhere. On section it was noted that the left lung was rather darker in colour than the right. In the lower lobe there was a small cavity containing pus and altered blood and two small, pinkish bodies, smooth and rather cystic in appearance. These were removed for further examination; the left cavity had a definite lining, but was not very thick walled. The cavity was about two and a half centimetres in diameter. No similar lesions were present in this or the other lung.

The pericardial sac was obliterated by fibrous adhesions. The heart weighed 321 grammes (ten and three-quarter ounces). The right chamber was dilated, thin walled and flabby, the tricuspid valve admitted three fingers easily and the tips of four. The mitral valve admitted two fingers. The valve curtains were normal. The aorta contained a small raised plaque just above the valve. The aortic valve was normal. The coronary arteries were normal in the proximal portions.

Examination of the peritoneum revealed general adhesive peritonitis. Old, firm adhesions between the liver and the diaphragm, between the spleen and the parietes and between various coils of intestine, particularly in the neighbourhood of the caecum, were present. The appendix was retrocaecal and bound about with adhesions. The greater part of the bowel had a roughened and sticky peritoneal coat. Several small bodies somewhat resembling retrograde tubercular nodules of encysted parasites were encountered on the peritoneum covering the organs one near the bladder, others on the small intestine, one on the surface of the liver, another entirely calcified deep in the pelvis. These had fibrous envelopes and contained whitish to coffee-brown, pasty, rather gritty matter.

The spleen weighed 480 grammes (sixteen ounces). The capsule was thickened. On section it was found to be dark and very soft at the upper pole; elsewhere it was fairly resistant to pressure. No focal lesions were seen.

The right kidney weighed 97 grammes (three and a quarter ounces). It was pale with areas of discoloration. On section it had the appearance of cloudy swelling; the cortex was increased in width and poorly defined.

The left kidney weighed 104 grammes (three and a half ounces). On section it presented a similar appearance to the right.

The medulla of the suprarenal bodies was diffuent.

The liver weighed 650 grammes (fifty ounces). Perihepatic adhesions were present. On section it presented a brownish, nutmeg appearance. Its consistency was rather soft. No focal lesions were present. The gall bladder was moderately distended; no calculi were present.

The stomach, duodenum, pancreas and ducts appeared to be normal. The small intestine was not opened; it appeared normal as it was passed through the hand. No ulceration was seen through the wall which in parts was dilated and thinned.

The large intestine from the transverse colon to the sigmoid contained large, solid faecal masses. The mucosa of the descending colon and sigmoid was pale, no signs of dysentery were seen here or elsewhere.

The bladder contained a few ounces of urine. No abnormality was present. The pelvic veins on either side of the bladder and rectum were dilated and several were thrombosed.

The testes were normal.

The bodies removed from the lung cavity were found on examination to be trematode worms having the main characters of the genus *Paragonimus* (see accompanying figures).

The peritoneal nodules were merely fibrous capsules filled with amorphous matter containing no recognizable organized structure. Examination revealed no tubercle bacilli.

The *post mortem* findings may be summarized as follows:

1. The lung cavity contained two trematodes resembling *Paragonimus westermanni*; brownish pus was present.

2. There was chronic inflammation of all the serous membranes with obliteration of pleural and pericardial sacs.

3. Old nodules were scattered about the peritoneum, resembling obsolete parasitic cysts. Some contained inspissated matter of the same colour as the pus from the lung.

The complete specimen was examined by both of us. Though, unfortunately, it had been dropped into alcohol without previous immersion in saline solution and was in consequence contracted and opaque, there was no doubt as to its identity. The ova were also typical. It has been forwarded to the

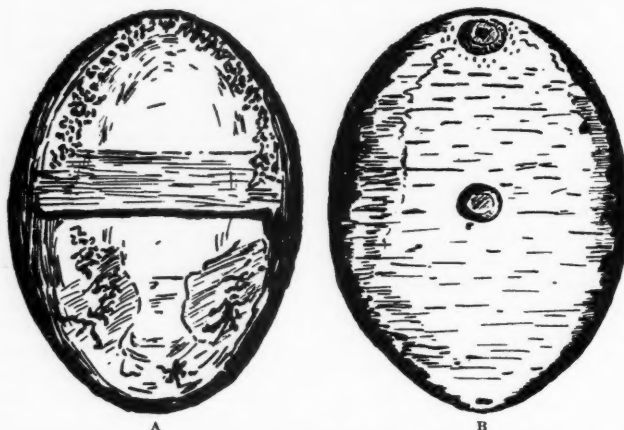


FIGURE II.

Paragonimus? westermanni; $\times 10$. A = Dorsal view; B = ventral view. Colour of fresh specimen, dull pink to red, greyish by reflected light. Alcohol specimen grey, red by transmitted light. Vitellaria well marked from dorsal aspect by transillumination; genital organs only suggested. Pharynx and alimentary canal not seen. Little to be seen from ventral aspect but external organs, anterior sucker, mouth, ventral sucker. Anterior sucker subterminal. Spines not well seen, but appear lancet-shaped and generally distributed rather than arranged in groups.



FIGURE III.

Paragonimus westermanni; Ova $\times 3,000$. The ova were expressed from the uterus of the second fluke in the cyst, not that figured above. Vary in shape, but more generally as in B and C. Length from 67 to 96 μ . Breadth from 44 to 48 μ . Well marked operculum, usually at broad end; vitelline cells present. Yellowish brown in colour; shell thin, easily ruptured by pressure on cover glass.

Australian Institute of Tropical Medicine, Townsville, North Queensland, for further study.

The Disease Manifestations.

Paragonimiasis or endemic dæmoptysis results from infestation with the trematode parasite *Paragonimus westermanni* (Kerbert 1878). Up to the present it has been recorded as endemic in Japan, Formosa, Indo-China, India and Peru and enzootic in the United States and Venezuela.⁽²⁾ In many of the endemic areas a notable proportion of the population is affected.

The optimum habitat of the parasite is the lung, but it has been seen also in the abdominal organs and tissues, the lymphatic glands, the muscles and the brain. In pigs infestation is said to be practically limited to the lungs; hence it is supposed that in man the varied location of the parasite or its ova indicates straying in a less congenial host.

The pathological appearances in the lung of man are "peculiar, bluish, slate-coloured, necrotic, cystic lesions, with rather dense, fibrous walls which contain a material resembling anchovy sauce and usually the ova or parasites." This was so in our case.

Bronchopneumonia, bronchiectasis, ulcerative lesions of the skin and mucous membranes and lesions of the brain, pancreas, muscles and other organs are occasionally seen. Musgrave details four types of symptoms under the headings: (i.) generalized, (ii.) thoracic, (iii.) abdominal, (iv.) cerebral, but Clayton Lane and Low insist that the disease must be considered as primarily a pulmonary infestation.

Excellent descriptions of the symptomatology are given by these writers and also by Manson-Bahr.⁽³⁾ As to prognosis it is said to be doubtful if recovery ever occurs. Life may be cut short by septic complications or the disease may not cause much trouble for years.

When the disease is complicated with tuberculosis, the prognosis is naturally much graver, while if brain lesions (always unrecognizable) are present, it is hopeless.

The method of infestation is in doubt, but is debited to a suspected first larval stage in molluscs, such as *Melania libertina*, *Melania obliquegranosa*

and other species of *Melania*, to a suspected second larval stage in certain crabs and crayfish, such as *Potamon obscuripes*, *Potamon debaani*, *Sesarma debaani*, *Eriocheil japonicum*, *Astacus japonicus*, *Asticus similis* and others. The definite hosts are the pig, cat, dog, man, tiger, *Felis bengalensis*, the pig being the optimum host.

In New Guinea the disease was found in a male native of the village of Awursingi, near the south-east coast of the island of New Britain, in latitude 45° 50' south (approximately) and 152° east longitude (approximately). The village is inhabited by primitive natives who have had practically no contact with either white men or Asiatics and therefore the disease is with some probability regarded by us as endemic locally. A point of the greatest interest in this connexion is that the natives of the whole of these coasts and rivers are exceedingly fond of crabs which form a considerable item in their diet.

Further investigations on the habits of the people and the possible presence of *Melania* spp. are in hand.

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TWO INTUSSUSCEPTIONS ALTERNATING WITH TWO ADENOMATA OF THE SMALL BOWEL.¹

By F. W. D. COLLIER, M.B., Ch.M. (Sydney),
Honorary Assistant Surgeon, Newcastle
Hospital.

IN August, 1924, a married patient, aged twenty-six years, was operated on for general abdominal pains and vomiting. The pains were griping and she had only two days' freedom now and then; every two months she had a bad attack of pain and vomiting. Appendicectomy was performed and an adenoma of small bowel fifteen to twenty centimetres above the caecum was removed.

For two months after this she was better; she was then seized by some griping pains and vomiting.

I saw her for the first time twelve months after the first operation. There was no swelling to be felt and the symptoms were those of obstruction probably due to adhesions. I opened her abdomen and easily reduced an intussusception fifteen to twenty centimetres above the scar in the bowel, where the tumour had evidently been removed by an elliptical incision. The intussusception was about ten centimetres long and the bowel above it was much hypertrophied and dilated; below that it was normal. She was then four months pregnant.

Within a few days of this second operation the same griping abdominal pains with occasional vomiting returned. I thought the intussusception had recurred, but the patient refused for a while another operation.

Soon after going home she vomited blood nearly every day till her confinement in January, 1926. No blood was vomited after that date. Only once did she notice melæna, two months after confinement. All the time she had the general abdominal pains and griping with vomiting, but the bowels were kept open with medicine.

¹ Read at a meeting of the Newcastle Hospital Clinical Society, November 4, 1926.

I saw her again in June, 1926. She had severe anæmia from loss of blood; she had lost at least six and a third kilograms (a stone) in weight and was altogether a miserable wreck. Again no tumour was felt. She consented to operation and I opened her abdomen through the old scar, but the ileum was quite normal. Higher up however, I came across a pedunculated adenoma almost filling the bowel and eighteen to twenty centimetres above that an intussusception eight to ten centimetres long within about fifty centimetres of the duodeno-jejunal junction. The bowel above and including the intussusception was thickened and dilated to size of large bowel; below that the bowel was normal even at the site of the tumour. I performed a double bowel resection, of the swollen apex and adjoining bowel of the intussusception and of the bowel containing the tumour which I now show you. You will notice that the bowel is of normal size and the tumour fits loosely in it. The tumour was therefore distal to the intussusception. The tumour is pedunculated; there are no signs of torsion, ulceration or gangrene. Each tumour, examined histologically, proved to be a simple adenoma.

The patient had a smooth recovery. I saw her two months later and she looked much better and had put on weight and was quite well.

There is no doubt that this woman had two adenomata and two intussusceptions along her small bowel at the same time for months; in the order from above downwards of intussusception, adenoma, intussusception, adenoma.

I report this case not only because I believe it to be almost unique in one respect, but as a contribution to the vexed question of the causal relationship between new growth and intussusception. That there is a causal relationship is proved by a case mentioned by Wardill⁽¹⁾ and especially by a case recorded by Barrington-Ward.⁽²⁾ Chronic primary intussusception, however, may occur in children⁽³⁾ and in adults.⁽⁴⁾ In most cases the tumour is at the apex and these are easy to understand, even when the appendix has been intussuscepted into the caecum in association with polyposis of its base.⁽⁵⁾ Other cases mentioned by Wardill reveal that sometimes the tumour is proximal to the apex but in the intussusceptum and that at other times it is not in the intussusceptum, but on its proximal side. In my case both tumours were about eighteen to twenty centimetres from the intussusception before reduction and on the distal side of it. There can be no mistake about this, otherwise the lower intussusception would have been found at the first operation when the tumour was removed.

Wardill's explanation of the causation is that:

The tumour, lying within the lumen of the bowel, acts as a foreign body and produces spasmodic contraction of the gut around it, with inhibition of that part immediately distal. The conditions are now favourable for that final act of peristaltic gymnastics whereby the contracted part is induced to slip into the dilated portion.

This applies obviously only to cases with close proximal tumours. In my case the conditions were the same at each end of the bowel—the tumour and the intussusception the same distance apart, the intussusception was only short and the sheath and bowel above was very dilated, especially in the upper one. Before the intussusception formed, the bowel above the tumour must have been almost constantly in a state of contraction in its effort to expel the tumour. Is it possible that this contracting, at a point eighteen centimetres above the

tumour, after a time began to give way to dilatation and that the bowel there became folded over the contracted part and as dilatation increased, the dilated bowel slipped further down at its own expense? Bearing on this there is a reference in the volume on general surgery of the "Practical Medicine Series" of 1920 to a report by Oden⁽⁶⁾ of an intussusception that existed between two polypi ten centimetres apart. At the operation "shortly after reduction, there was a marked retrogressive peristalsis, with a drawing up of the large tumour into the proximal section, showing a tendency toward recurrence." No note was made at the time as to whether my case was one of retrograde intussusception. Wills⁽⁷⁾ suggests that the absence of the tumour from the apex of the intussusception is due to the fact that the tumour is undergoing self-reduction.

As regards incidence these tumours, of course, are decidedly rare. King, quoted by Thorek⁽⁸⁾ has pointed out that there were only eight cases of true, solitary, intestinal tumour in 44,654 laparotomies in the Mayo Clinic. King also states that the order of frequency is, myomata, lipomata, adenomata, fibromata, angiomata, fibromyomata and neurofibromata and fibroadenomata. There is also a case of intestinal cyst causing intussusception.

The symptoms may last many years and vary from uneasiness to attacks of severe, griping, generalized abdominal pains. The pains are due to efforts to expel the tumour, to partial obstruction and to the formation of intussusception. With the pains there is often vomiting. Melæna is often noticed and is thought to come from the tumour. In none of the cases I have read in the literature is vomiting of blood mentioned, but it was a prominent sign only during the later months of pregnancy. In two or three patients complete obstruction of bowels occurred. The tumour was often palpable.

The treatment is always surgical. Even though the intussusception can sometimes be reduced by manipulation (Barrington-Ward) the intussusception will always return till the tumour is excised. The bowel containing the tumour should be excised because in 1911 five cases of malignant disease of the small bowel were reported from the Mayo Clinic, of which two had started in a pedunculated adenoma with intussusception. If an intussusception is found, the tumour should always be sought some distance away on either side. The intussusception should be excised because two or three cases have been reported in which a small tumour was hidden in the swollen mucous membrane and overlooked, with the result that recurrence took place.

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Reports of Cases.

MESENTERIC CYST SIMULATING ACUTE POST PARTUM DILATATION OF THE STOMACH.

By ALAN E. LEE, M.D. (Melb.), F.R.C.S. (Eng.),
Relieving Surgeon to Out-Patients,
Brisbane Hospital.

Clinical History.

N.C., *primipara*, aged twenty-four years, had engaged the writer to attend her in her confinement.

She was seen during the third and the sixth months of her pregnancy and abdominal examination at these times revealed no abnormal physical signs. She was advised to present herself regularly for antenatal supervision, but neglected to do so. On September 15, 1926, four weeks before the expected date of confinement, the writer was called to the patient's house to find that labour had been proceeding for three hours and that the fetal head was practically presenting at the vulva.

There being no facilities for conducting a delivery at the house, the patient was put in the motor car and hurried to a nursing home a short distance away.

Here pains continued for one and a half hours without any further descent of the head. To make certain of the fetal position, an anæsthetic was then administered and an anterior vertex position having been confirmed, the delivery was completed with forceps and one suture immediately inserted into the small perineal tear.

On inspection of the abdomen about two minutes after the birth of the child it was seen that the uterus was hard and retracted, but above it, occupying the supraumbilical region near the midline was a larger soft indefinite swelling, feeling on palpation like a bunched up mass of intestines. The unusual appearance was commented on to the nurses, but, the third stage being satisfactorily completed, no further interest was taken in it at the time.

Three hours later the patient was again seen and reported having vomited following a drink of tea, but stated that this had recently been a common occurrence with her. Another visit was not made till the following day. It was then reported that the patient had vomited frequently during the twenty-four hours, the most striking feature being the enormous amounts of fluid vomited, the total according to the nurses being not less than two gallons.

The abdomen was now inspected. In its upper half, a tumour was plainly visible, in size about twenty-five centimetres by fifteen centimetres, midline in position with its long diameter transverse. It was convex downwards as to both its upper and lower borders, that is bean-shaped. It was dull to percussion and tensely full of fluid.

The appearance of such a tumour apparently directly after the termination of labour, the type of the vomiting and the configuration of the swelling seemed to render the condition obvious and the diagnosis of acute *post partum* dilatation of the stomach was made.

The patient was turned into the prone position and the pelvis raised some twenty centimetres by pillows.

It was prophesied that rapid improvement would occur. This was apparently borne out, the report twenty-four hours later being that vomiting had occurred only once and the patient herself felt very much better. Later in the morning another attack of vomiting occurred and a medical consultant was then called in. He agreed with the diagnosis, administered a stomach wash-out and the prone posture was again enjoined. A favourable prognosis was again given.

The material obtained by the stomach lavage was a greenish acid fluid; suspended in it was an abundant brown solid sediment which settled to the bottom on the fluid being allowed to stand. It was noticed at the time of the lavage that, although several pints of stomach contents were removed, the abdominal tumour still persisted almost unchanged in size, though it appeared less tense to palpation.

In spite of the hopeful prognosis, vomiting still continued to recur two to three times daily and by September 19, 1926, the fluid loss was being severely felt. This was accentuated by the fact that the patient proved very intolerant to saline solution given *per rectum*.

It appeared clear that the patient did not belong to the great majority of such cases in reacting rapidly to the influence of posture and it was felt that, seeing that an indefinite time might elapse before relief would occur, some more certain means of introducing fluid should be provided. The patient was therefore sent to hospital with the advice that jejunostomy should be performed.

She was admitted into the gynecological section of the Brisbane Hospital, under Dr. Alex. Marks, to whom I am indebted for permission to publish the subsequent history of the case.

The diagnosis was not at this time questioned, but it was felt that more energetic medical treatment should be persisted in for a while, while a renewed attempt to introduce fluid *per rectum* was to be made.

Under the changed nursing conditions the patient was found to retain fluid readily and this method of feeding was carried on for ten days.

Stomach wash-outs were instituted every four hours, following the advice (surely unjustified) in Carson's "Operative Surgery" that "lavage is simple, safe and effectual." Eserine 0.26 milligramme (one two hundred and fiftieth of a grain) and "Pituitrin" 0.5 cubic centimetre were injected every four hours. The persistence of the abdominal tumour was thought to be due to air-swallowing and to obviate this a suggestion in Lejar's "Urgent Surgery" was adopted and a cork inserted between the teeth. The prone and knee-elbow positions were still maintained.

During the following days the vomiting still continued intermittently, but the fluid absorbed *per rectum* caused a definite improvement in the patient's general condition. During this time the abdominal tumour was gradually sinking lower in the abdomen and now approached the pelvis. At this stage a barium meal was given and the stomach examined by X rays. The report was to the effect that the stomach was dilated. Pyloric and gastric spasm was followed by intensely rapid passage through the duodenum and was again followed by spasm. Placing the patient face downwards caused relaxation of spasm and this recurred when she was in the dorsal position. The second part of the duodenum was dilated and some obstruction was present here. The only tumour felt at the time of X ray examination corresponded with the uterine position.

The abdominal tumour thus being shown to be not the stomach, the whole diagnosis had to be reviewed. The probability now seemed to be that we had to deal with an ovarian tumour, probably adherent to the duodenum or upper jejunum. The possibility was also advanced that the whole condition was that of a twisted ovarian cyst; though it seemed to the writer that the history absolutely precluded such a possibility.

No further improvement occurring, operation was undertaken on October 4, 1926 by Dr. Marks, assisted by the writer. By this time the tumour was lying deep down in the pelvis, bulging the anterior vaginal wall like a distended bladder.

The parietal peritoneum having been incised a smooth peritoneal-covered cyst appeared in the wound. Palpation revealed no pedicle in the pelvis and the cyst was delivered out of the abdomen, its size being that of a small football. Some veins of considerable size were coursing over its surface, these converging towards its upper margin, where a broad peritoneal band was seen to unite the cyst to the under-surface of a piece of small gut mesentery. After emptying two litres of fluid macroscopically resembling milk from the cyst, it was excised completely without any difficulty, redundant peritoneum was removed and the rent in the mesentery sutured. The cyst's removal now allowed a more thorough intraabdominal exploration. The following state of affairs was then disclosed.

The stomach and duodenum were dilated and empty. When the transverse colon was lifted upwards the dilated duodenum could be seen beneath the posterior parietal peritoneum, but instead of coming to the surface, it immediately passed downwards under another mesentery. This proved to be that of the terminal loop of ileum which here was running parallel to the large bowel. Immediately below this mesentery the duodenum turned forwards and to the right just as at a normal duodeno-jejunal flexure and it was from the lower surface of the highest piece of jejunal mesentery that the cyst had been excised. It was so close to the flexure at this point that the gut had been much stretched out over the large cyst, as well as being kinked by the downwards drag. It was apparently by the relief of this drag that the prone posture had lessened the symptoms.

The abdominal wall was closed in layers and convalescence was uneventful.

A careful review of the patient's past history was later made to see whether any clue could be obtained to the time of growth of the cyst. The following relevant facts were obtained. During the last three months of the pregnancy the patient had vomited nearly every day, usually in the evening, the striking fact to the patient being the enormous quantity of fluid she would bring up. Vomiting made her feel better, but to insure an uninterrupted night's rest she found it necessary to adopt the prone position and this posture had been her habitual one for the months immediately preceding the confinement.

Discussion.

The interest of this case lies not chiefly in the narration of the history of a rare condition, but rather in that a very much rarer diagnosis was wrongly made and justifiably maintained, for a considerable period of time.

The points the case offers for discussion are therefore: (i.) The justification for the mistaken diagnosis of acute dilatation of the stomach; (ii.) the diagnosis and treatment of mesenteric cysts; (iii.) the explanation of the intestinal abnormality.

The tumour appeared to be of recent origin. The patient had been seen six months before and again three months before the onset of labour and on neither of these occasions was any other tumour than the pregnant uterus present on abdominal examination.

In regard to the appearance of the tumour its midline location with its long axis transverse and general bean-shape appeared to be exactly what would be expected of a dilated stomach beneath a lax abdominal wall. The type of vomiting was extremely typical. The vomitus came up in huge quantities, appearing to be acid stomach contents and it maintained that appearance, never exhibiting the changing characters of the vomit of a high intestinal obstruction.

Against the diagnosis was the fact that the tumour did not collapse when the stomach tube was passed, the absence of much gas in the stomach contents and the non-reaction to correct treatment.

Acute dilatation of the stomach may be regarded as a condition in which for unknown reasons a loss of postural tone primarily occurs.

If the stomach contents should then increase, the organ can progressively enlarge in size till enormous dimensions are reached.

The filling substances are in order of frequency (i.) swallowed air, (ii.) excessive quantities of food, (iii.) gastric secretion.

This primary gastric distension produces a secondary duodenal obstruction in two ways. Firstly by direct pressure, the third part of the duodenum is compressed against the lumbar vertebrae. Secondly the great increase in size of the stomach forces the small intestines towards the pelvis. The elongation of the mesentery, thus produced, causes stretching of the superior mesenteric vessels over the third part of the duodenum and thus obstruction. This secondary obstruction causes a further increase in the gastric dilatation and so a vicious circle is set up.

The modern treatment which in a series of thirty-one reported cases gave twenty-nine recoveries, aims at relieving this vicious circle. The stomach is emptied either by vomiting or the stomach tube and the patient is then turned into the prone posture. The small intestine under the influence of gravity passes upwards and forwards, the drag on the superior mesenteric vessels is reduced and the secondary obstruction thus relieved. This usually suffices to effect a cure.

All other methods have a high mortality. Gastric lavage alone, according to Carson's "Operative Surgery," is "simple, safe and effectual." But it is found, when any large series of cases is investigated, to have a mortality exceeding 50%.

Altogether some two hundred and fifty cases of mesenteric cysts have been reported in the accessible literature. There has been considerable latitude in choosing cases to be included under this title. Broadly speaking, any cyst occurring between the layers of or in close relation to the mesentery, might be included under the term "mesenteric."

This definition would include several cystic conditions whose pathology is not peculiar to this region, these briefly being dermoids, cystic malignant disease and parasitic cysts. They are of no particular interest to the case in point except that from the diagnostic standpoint it is interesting to note that all mesenteric dermoid cysts so far recorded have been in females.

Classification of Mesenteric Cysts.

True mesenteric cysts, that is cysts peculiar to this position, can be included under three or perhaps four aetiological groups.

The first group is that of obstructive cysts. The obvious chylous character of the contents of many of these cysts has suggested that they are dilatations of mesenteric lymph vessels due to obstruction. This was once the accepted theory, but now has been largely abandoned owing to the impossibility of explaining the epithelial lining often possessed by these cysts.

The second group comprises those due to developmental errors. These may be divided into two classes. In the first place a cystic condition in remnants of the Wolffian body is an accepted explanation of the origin of many retro-peritoneal cysts and it is probable that these remnants may be carried into the developing peritoneal folds of the mesenteries and thus serve as a nidus for true mesenteric cysts. In the second place the common occurrence of these cysts close to the terminal portion of the ileum, has drawn attention to the peculiar peritoneal relationships of this region. In the third stage of midgut rotation the two folds of the mesentery of the ascending colon are brought into contact with the peritoneum of the posterior abdominal wall. Normally only the anterior of these three superimposed layers persists, the middle and posterior being converted into subperitoneal tissues. Should any portions of these latter layers persist as a peritoneum-lined sac, the potential conditions for the formation of a cyst are present; it seems probable that this is actually the method of formation of these common ileo-caecal group of cysts.

The third group comprises diverticula of the intestines. There is good evidence that some of these cysts arise as diverticula from the intestine. Diverticula occur frequently from the small intestine in the embryo and especially from the duodenum. Lying as they do between the layers of the mesentery, it requires no great stretch

of the imagination to suppose that they might become separated from their origin and form true mesenteric cysts.

Mesenteric cysts may conceivably arise from a persistent Meckel's diverticulum or from a persistent portion of the vitelline duct. In order that cysts from this origin may arise in the mesentery it is necessary for the duct to originate from the concave side of the intestine.

Histological examination of the cyst wall, together with a consideration of its position in relation to the gut, will often give a clue as to the actual aetiology of the cyst under discussion. This reported case is, of course, strongly suggestive of a diverticular origin, that is, it is an enterocystoma.

The contents of a cyst are not of special importance. Lymphatic, chylous or sanguineous contents merely denote accidents which may befall any cyst.

Diagnosis.

The diagnosis of mesenteric cyst, though it should be attempted, offers very great difficulties. Occurring usually in young adults, the majority of these cysts are symptomatically silent tumours. Symptoms when present usually consist of those of subacute or acute obstruction.

The tumour is smooth, rounded and cystic, midline in position; mobility is often a striking feature, usually greater in the transverse than in the vertical direction.

The differential diagnosis is chiefly from ovarian cysts, retro-peritoneal growths, very large hydronephrosis, pancreatic cysts, new growths of intestines, pregnant uterus and ascites of varying origin.

Complications.

(i.) Acute obstruction has occurred in nearly 50% of reported cases, the group mortality of thirty-five cases due to this cause being 35%.

The methods of obstruction noted include volvulus, intussusception, kinking, adhesion and narrowing or occlusion of the gut by pressure of the tumour or stretching of the intestine over it. (ii.) Hæmorrhage into a cyst may be of alarming proportions and at least one fatal case has been recorded. (iii.) Rupture, torsion and impaction in pelvis are complications also recorded in these cases.

Treatment of Mesenteric Cysts.

In acute cases the treatment will be primarily directed towards the relief of the emergency present.

In subacute or chronic cases, a direct operation on the cyst should be attempted. Enucleation is nearly always possible and in the few cases where this has been deemed inadvisable, marsupialization and drainage has been carried out. Very occasionally the simplest plan has seemed resection of the cyst together with the contiguous segment of gut followed by end to end union of the divided segments.

Explanation of the Intestinal Arrangement Present.

Between the fifth and tenth weeks of intrauterine life owing to the very rapid growth of the liver within the abdomen, the midgut loop is forced to take up a position in the umbilical cord and then in a sense is existing in a hernial sac.

Its growth here proceeds to such an extent that reduction *en masse* becomes impossible and an orderly return of the gut in sequence has to be arranged.

Usually the most proximal loop returns first, followed in order by the more distal loops, the bulky caecum, growing as it does as an outgrowth from the distal limb of the midgut loop, returning last.

The first intraabdominal position of the caecum (following this reduction) is therefore in the region of the future umbilicus and anterior to the small gut.

By a combination of two factors, (a) the direction of growth of the lower margin of the liver and (b) the elongation of the colonic loop, the caecum is forced to pass first upwards and to the right to the under surface of the liver and then downwards along the lateral abdominal wall, till it takes up a position in the right iliac fossa.

During this semicircular course the terminal loop of ileum usually behaves as a radius of the sector travelled by the caecum and thus comes to occupy its normal adult position.

Should, however, the small gut instead accompany the caecum along the circumference of the circle and maintain this position into adult life, the distal loop of ileum will be found to lie parallel with and below the colon and the duodenum will pass under its mesentery as well as that of the transverse colon.

This I think is the probable explanation of the abnormality here reported.

Conclusion.

This case is therefore to be looked on as one in which certain abnormalities occurred in early fetal life. As a result firstly, an abnormal intestinal arrangement persisted and secondly, certain diverticula were formed.

As a result of one of these losing its connexion with the intestine a potential cyst occurred which probably lay latent till within the last three months, when a lymphatic vessel must be supposed to have burst into its lumen and caused a rapid increase in its contents.

A subacute intestinal obstruction was secondarily produced, partly by kinking the gut at the duodeno-jejunal flexure and partly by narrowing of the gut lumen by stretching over the cyst walls.

HYPNOTIC SUGGESTION.

By IRIS MORGAN, M.B., Ch.M.,
Honorary Physician, Newcastle Hospital,
Newcastle.

I HAVE found the method of treatment by hypnotic suggestion of such value in certain cases, that I thought a brief record of a few of them may be deemed worthy of publication. In each instance care was taken to exclude any organic lesion. The method of inducing the hypnotic state used was that described by Betts Taplin (hypnotic suggestion and psychotherapeutics). The cases recorded have been chosen to illustrate the success achieved by the use of this method of treatment, when other methods had apparently failed.

The procedure is simple and easily applied. I have found it an extremely valuable addition to my therapeutic armamentarium. Hypnotic suggestion is a form of treatment which does not seem to have found much favour in the eyes of the medical profession as a whole. It is such a valuable and efficient method of relieving and curing many forms of mental and physical incapacity that it is difficult to understand why this should be so. It is a harmless form of treatment. There are indications and contraindications for its use as is the case with any form of therapy.

The procedure is simple and easy to apply, it does not consume an unreasonable amount of time and is therefore eminently suitable for use in general practice.

Post-Traumatic Hysteria.

Case I.

The patient was a boy, aged sixteen years. Six weeks before he was first examined by me, he had fallen and had injured his "left elbow." A radiogram revealed a fracture through the base of the internal condyle of the humerus. The forearm had been fully flexed upon the upper arm and maintained in that position by means of bandages.

Firm union took place in three weeks. When the bandages were removed, it was found that the patient could not extend his forearm. Massage, forced movements and electricity had been used without improving the condition.

A diagnosis of hysteria had been made. The patient was an intelligent lad and had distinguished himself at school and in the trade to which he was apprenticed. The

nature of his incapacity had been carefully explained to him in the presence of his father. Both parent and son seemed to understand the explanation, but in spite of the exhortations of the doctor and the father, the range of movement at the elbow joint remained unaltered.

An orthopaedic specialist was then consulted and he confirmed the diagnosis of hysteria.

On examination on January 13, 1926, six weeks after the accident, the patient held his forearm in the fully flexed position. He was able to extend the forearm through an angle of 30°. The forearm could be forcibly extended to a position at which it was at right angles to the upper arm. He complained of pain when this was done. Restriction of movement was obviously caused by strong contraction of upper arm muscles.

I saw him on January 14 and 15 and carefully explained what I intended to do and how much the success of the treatment depended on his cooperation.

On January 16, 1926, I induced hypnosis without difficulty. While he lay on the couch, I explained the nature of his complaint in simple terms and suggested the return of the normal function of the joint. As he had intimated that he possessed some faith in "the battery," I also made suggestions concerning the efficacy of electricity as an aid in effecting a cure. A galvanic current was applied for a few minutes at the conclusion of each sitting.

Three short treatments sufficed. One week after the first treatment he resumed work. To date (November 15, 1926) there has been no recurrence of his symptoms.

Case II.

The patient was a boy, aged fifteen years. He was an intelligent lad, the possessor of a number of boy scout efficiency badges.

Six weeks before I saw him he was thrown from a pony. The pony fell and kicked him as he lay on the ground. The pony's hoof came in contact with the skin over the lower lumbar vertebra.

On admission to hospital he had been unable to move his legs, stand up or walk. Complete anaesthesia to touch had been present below the level of the umbilicus. A general anaesthetic had been administered and while anaesthetized he had kicked vigorously. No symptoms or signs suggestive of injury to the spinal cord or main nerve trunks were detected. A radiogram did not reveal any injury to the bones of the vertebral column or pelvis. A diagnosis of hysteria had been made.

Explanation, persuasion and modified Weir-Mitchell treatment had been tried, but no improvement had been effected.

When I first saw him he lay in bed with his legs held firmly in an extended position. He was able to perform all movements of the ankle and hip joints, but was unable to make any movement of the knee joints at all. Complete anaesthesia to light touch below the level of the umbilicus was still present.

When he sat on the edge of the bed he continued to hold his legs in a rigid position and successfully resisted all attempts to flex the legs upon the thighs. His thighs were held so as to form an angle of 100° with his body. He also successfully resisted any attempt to extend the thighs further by force.

A pillow was placed across the dorsum of both feet and three ordinary building bricks were placed upon the pillow. The weight of the bricks raised his buttocks from the mattress, but caused no alteration in the position of the legs or thighs. After fifteen minutes the bricks were removed. A truly remarkable instance of the powers of hysterical endurance!

On attempting to stand or walk he lurched in a typically bizarre fashion and reached out for support. If no support were at hand, he lowered himself to the floor with his legs stuck out like two rigid poles.

The rationale of the procedure about to be adopted was explained to him. The room was darkened and an attempt to induce hypnosis was made. The presence of other people in the room distracted his attention to such an extent that the attempt was a failure. The spectators were asked to retire and hypnosis was induced without difficulty.

An explanation of the condition was given and appropriate countersuggestions were made. The sitting lasted a few minutes only. Immediately after he walked out of the room and along the passage unaided, but he refused to bend his knees.

He was immediately pressed into service by the nurses as a "generally useful." Two more sittings, at which additional suggestions of the efficacy of electricity were made, resulted in further improvement. No further hypnosis was required. The post hypnotic suggestions concerning "the battery" resulted in a rapid and complete cure. He returned to work two weeks after the first sitting. There has been no recurrence of the symptoms.

The return to normal may have been accomplished even more rapidly if it had been possible to apply the treatment daily.

Comment.

These two cases are typical of post traumatic hysteria. They illustrate the value of hypnotic suggestion in effecting a rapid and effective cure in such cases. The rapidity of the cure, particularly if the treatment is applied soon after the injury which acted as the starting point of the hysteria, is striking.

From an economic point of view, the reduction of the period of incapacity, consequent upon the use of this treatment, enhances its value.

Stammering.

Case III.

The patient was a male, aged nineteen years. This patient presented himself to me first on August 23, 1920, complaining of stammering. He stated that he had always enjoyed "perfect health." He had received a good education and had been obliged to refuse several good positions on account of his unfortunate inability to speak without stammering. Sometimes, as was the case when he attempted to address me first, fully a minute elapsed before he was able to enunciate a single syllable. He was in charge of a cash register in a store. He explained that he had undertaken this work, because it allowed him to avoid speaking to anyone. His stammer was not so pronounced when he spoke to his own family or his intimate friends, but he dreaded conversation with anybody else. As he preferred to spend his evenings at home he had experienced no difficulty in passing all his examinations, only to find that his stammer condemned him to the cash register of a store. He was unable to remember any terrifying experience which might have been the starting point of his trouble. His mother volunteered the information that the stammer had commenced suddenly when he was four years of age.

Treatment by means of hypnotic suggestion was commenced on August 23, 1920. The countersuggestions made were based upon the statements made by the patient concerning his apprehension on endeavouring to speak *et cetera*.

Gradual improvement manifested itself from the commencement. At the third sitting an endeavour was made to recall any terrifying experience which may have occurred when the patient was about four years of age. He was unable to do so then. When he reported for the fourth treatment he related the following incident. His elder brother corroborated it. One day, in company with his elder brother and sister, he had been playing on a swing. He had fallen off. The elder children, fearing the wrath of their mother, had threatened him with all sorts of dire punishment if he told mother.

When he arrived home weeping copiously, he had commenced to tell his mother what had happened and had received a severe jolt in the ribs from his brother, which procured silence.

His mother said the stammering commenced when he was four years old. This incident was possibly the origin of the stammer. Nine treatments were given, the last on October 4, 1920. He reported on October 25, 1920, and stated that he had stammered three times only since his last visit.

Six years later, on November 10, 1926, the patient has been employed for some years in a responsible position and has not been troubled by his stammer.

Comment.

Many cases of stammering have been reported (Wingfield, Wetterstrand, Bramwell, A. E. Davies) in which hypnotic suggestion has been the means of effecting a cure. The method can do no harm and is worth a trial. A cure, however, cannot usually be accomplished in a few treatments.

In one series of twelve cases, six patients were reported as cured. In a second series of forty-eight cases, fifteen patients were reported cured, nineteen improved and fourteen unimproved.

Considerable improvement may be expected in all those who give the treatment a fair trial (A. E. Davis, "Hypnotism and Treatment by Suggestion").

In the case recorded above two factors must be credited with a share in accomplishing the desired result. The suggestions made under hypnosis played an important part, but the recollection of the swing incident (abreaction) which was apparently the emotional crisis responsible for the stammering was probably an equally important factor in effecting what can be fairly claimed as a cure.

War Neurosis.*Case IV.*

The patient had been a lieutenant in the Australian Imperial Force and was thirty-three years old when first examined in March 13, 1926. While engaged on a raid upon the German trenches in 1916 he was wounded in the left shoulder and also received a blow from a knoberry which struck the right side of the skull a glancing blow and then hit the right shoulder. The wound was slight and healed by first intention. The knoberry caused a contusion only of the skull and shoulder.

He is unable to remember even now (November, 1926) the events immediately succeeding the raid in which he participated. Six weeks after the night of the raid he found himself in hospital in England unable to remember the events following his evacuation from his battalion. He was able to remember what had happened in France, but could not remember his home and his former life in Australia. Very frequently he suffered complete amnesia for the events of one part of a day.

His right arm became paralysed, he held the hand firmly closed and was unable to perform any voluntary movements with the arm. This "paralysis" remained unaltered for seven months and was accompanied by a glove anaesthesia of the whole arm. He says that at that time his mind was dominated by a feeling of acute apprehension concerning something. He had no idea what this something was.

He was returned to Australia in this condition. Isolation, explanation, electricity and massage had been used in treatment. Scars upon the arm bear evidence of the application of a cautery. An attempt had been made to induce hypnosis in a military hospital, but as it had been made in the ward without a screen it had been unsuccessful.

During a thunderstorm, seven months after the arm first became "paralysed," full movement and sensation returned suddenly. Six weeks later, while sitting in a theatre, he suddenly commenced to weep, the paralysis and loss of sensation reappeared accompanied by a new symptom—aphonia. At the same time the old dominating feeling of apprehension returned and although, as he says, he did not lose his memory completely, he had to fight to retain it. He frequently commenced a sentence and forgot what he was talking about before the sentence was completed and was thus forced to leave it incomplete.

He regained his voice quickly and the arm movements returned in four weeks. He became very irritable, suffered from outbursts of temper and fits of depression. This state of affairs continued till March, 1923—six years. The thunderstorm incident occurred in 1917. There had been some improvement and he had commenced to work as the manager of a branch business.

When I first saw him on March 13, 1923, he complained of "fits of ungovernable temper," pain in the right arm, hand and neck, lack of ability to concentrate, frequent lapses of memory, loss of power in the right arm, insomnia, terrifying nightmares and general depression.

The right hand was swollen and exhibited glove anaesthesia to the shoulder. He was quite incapable of attending to his business. At night he shouted and lived through scenes of the war again. His wife says that he frequently called the roll (nineteen names) of the men of the raiding party without hesitation; he could not remember one of the names next morning.

He complained that he was quite incapable of any work and his life was a misery. He proved an excellent subject for hypnosis. Four sittings were given on four successive days. The result was most gratifying.

One month later (April, 1923) I was able to report that the symptoms had remained in abeyance completely and no further treatment had been required.

On April 27, 1923, he reported and stated that some extra business worry had caused a recurrence of nightmares and depression. These symptoms had been present for twenty-four hours. The arm remained normal and the period of freedom from arm symptoms (six weeks) was the longest he had experienced since 1916.

To date (November, 1926) there has been no recurrence of these symptoms. One sitting was given. The symptoms disappeared immediately and did not manifest themselves till August of 1923 when he undertook a motor trip to Queensland. He drove his own car. After two or three days of constant driving his nightmares and insomnia returned. He shipped his car and returned by train.

Two treatments were given on successive days and once again the symptoms disappeared.

Interviewed a few days ago (November, 1926) this ex-soldier states that he has had no recurrence of symptoms since August, 1923. He has managed his business affairs without any trouble, worry does not upset him, he has spent hours boxing and has driven his car hundreds of miles without ill-effects.

No attempt was made to analyse the psychic processes at work. Amnesia for the events immediately after the raid still exists. Hypnotic suggestion alone was used and it is claimed, succeeded even when a neurosis as severe as this one had been in existence for seven years. After three years there has been no recurrence.

Comment.

The foregoing case has been chosen from four similar cases treated by hypnotic suggestion, because of its typical features, the total incapacity caused by the complaint and the rapid and complete recovery obtained by means of hypnotic suggestion, even after the symptoms had been present for a number of years. Very gratifying results are obtained by treatment with hypnotic suggestion in cases of this type.

One patient had been given three treatments and had then been obliged to leave Newcastle. A big improvement had been obtained. He wrote and stated that he had been unable to persuade any of the seven medical practitioners he had visited to say a good word for hypnotic suggestion. The eighth continued the treatment with excellent results.

The seven condemnatory opinions cost him a sum of five guineas!

It is interesting to note that the symptoms disappeared as a result of the treatment, although the amnesia for the events which were undoubtedly the origin of the trouble, persisted.

The method of abreaction is frequently employed in such cases. The "buried" memories are recalled by the patient in the hypnotic state. The mere recollection of these events is often sufficient to produce marked improvement. In this case as in several others the amnesia for the period of onset of the syndrome still exists, but the symptoms have been in complete abeyance for a number of years. No endeavour to excavate these "buried" memories was made.

Insomnia.*Case V.*

The patient was a public accountant, aged twenty-seven years. He gave no history of previous illness. He complained that the slightest noise woke him and that he was unable to go to sleep again. He experienced no difficulty in going to sleep as soon as he went to bed, but every night some slight noise woke him and he was unable to sleep again that night. Next day he was tired and irritable. This state of affairs had existed for three or four years.

At first he had been disturbed occasionally, gradually his rest had been disturbed more frequently.

For two months prior to September 7, 1921, the day he sought advice, he had awakened every night. He stated that he was "tired all the time," was very irritable, could not concentrate upon his work, suffered from anorexia and dyspepsia and had lost one stone in weight. He had chosen the quietest locality he could find for his home and his unfortunate family lived in terror of his temper by day and his extreme susceptibility to slight noises by night. He was quite pathetic when he admitted that his business and his family suffered equally from the unfortunate acuity of his hearing, as he put it.

Occasionally, when he went away for a few days, he slept well at night and then "felt fit" during the day. More recently he had experienced a burning feeling across his head and a dull, aching pain "along the spine." Examination did not reveal any evidence of organic disease.

The patient smoked in moderation and was a total abstainer. He worked hard, but also took regular exercise in the fresh air.

He stated that when the symptoms commenced about four years before, his sleep had been disturbed by cattle driven past his home in the early hours of the morning to the sale yards.

Treatment was commenced on September 7, 1921. Hypnosis was induced without difficulty. Appropriate suggestions were made. No improvement was manifested at first. After three or four treatments the patient reported improvement. Treatments were given once a week to December 21. He then stated that no further treatment was required, as he slept regularly for seven or eight hours each night without waking. Interviewed in November, 1926, he reported no recurrence of symptoms.

Excessive Cigarette Smoking.

Case VI.

The patient was an accountant, aged twenty-eight years. He had suffered from rheumatic fever when seven years of age. The patient complained of dizziness, tachycardia, insomnia, frequent nocturnal emissions, lack of power to concentrate, lassitude, loss of weight and anorexia.

He was a well nourished, well developed man. Examination failed to disclose any evidence of disease, with the exception of a somewhat rapid pulse. He looked pale, tired and worried. As he gave his history it soon became apparent that he was extremely introspective and neurotic. His mind was hypersensitive concerning matters of sex. He stated that he was addicted to the habit of masturbation. He complained that he was unable to control this perversion. He also stated that he smoked sixty cigarettes a day and was unable to reduce the number.

He asked for treatment for these habits which he said had been in existence for six years. Treatment by means of hypnotic suggestion was given and suggestions calculated to effect a cure of both habits were made.

The treatment commenced on July 16, 1920, and was given daily at first and two or three times a week later till August 17, 1920.

The patient stated then that the perverted sexual habit had been completely overcome. His statement was the only proof that this was so. He further stated that he had reduced his cigarettes to ten per day. He looked better and said that his symptoms had disappeared.

Fortunately I made the acquaintance of the manager of the business for which the patient acted as accountant. He confirmed the truth of the statement concerning the disappearance of the symptoms and the reduction of the number of cigarettes smoked *per diem*.

This man visited me again on February 2, 1923, seeking treatment for a minor ailment. I then remarked upon the fact that he had gained weight and seemed to be in splendid condition. He volunteered the information that he had been able to cease smoking altogether shortly after his last treatment and had not smoked a cigarette since that date and that the other habit had also been completely overcome.

I saw him again on March 26, 1924; neither habit had been resumed.

Reviews.

LIGHT TREATMENT IN SURGERY.

THE translator—Dr. R. King Brown—of Dr. O. Bernhard's book on "Light Treatment in Surgery," has presented a book free of the usual stigmata of translations.¹ Dr. Bernhard has for thirty years been using sunlight and fresh air as adjuvants in surgery and since 1902 has been systematically using them as his main line both of attack and defence in his fight against surgical conditions, particularly tuberculosis of bones, at St. Moritz.

In this volume we have a very readable and interesting account of his theories, methods and results. The book is divided into two parts. Part I. is general and deals with the historical and scientific aspects of sunlight treatment including a most important chapter on climatology. Part II. deals with the special aspects of the subject such as the indications and method of application in general surgical work and in tuberculosis. Throughout the book great stress is laid on the importance of climate in conjunction with light. The author believes that the high mountain climate with its bracing tonic effect on the human organism and its clear atmosphere are necessary aids to full benefit from light treatment. He claims Rollier as his disciple, but is not so out-and-out a light therapist as the latter, believing that often operation—although not giving such good results—may be advisable for economic reasons on account of the shortened convalescence.

There is more than a mere mention of treatment by artificial light—quartz lamps—which even in the "high mountains" are called into use owing to weather conditions making sunlight unavailable.

The author is so enthusiastic and presents his case in so convincing a manner that the reader feels that in surgical tuberculosis at any rate operations must soon belong to history and that in almost every surgical condition met with sunlight should play a very much larger part in the treatment than is usually ascribed to it.

THE CONTINUITY OF LIFE.

PROFESSOR NOËL PATON in his book "The Physiology of the Continuity of Life" has performed a useful service in linking up the various aspects of this subject which are usually treated in separate volumes. In the opening chapter he discusses heredity with special reference to the transmission of adaptations and to the Mendelian theory of inheritance. The chromosome theory of inheritance is not accepted without criticism and points in favour of the gonadal cytoplasm being the bearer of hereditary characters are put forward.

The next chapter contains a review of agametic and gametic reproduction and is followed by a discussion of unisexualism, bisexualism and reversion of sex in which various illustrative examples from man and the lower animals are given.

The determination of sex forms the subject of two interesting chapters in which the transition from parthenogenesis to sexual reproduction is followed. The relative potency of the conjugating gametes and their influence in determining sex are outlined considerably. Consideration is deservedly devoted to the reciprocal influence of the gonads and soma. The importance of the endocrine glands in the sexual development of the individual cannot be too strongly emphasized. The oestrous cycle of the lower animals, the menstrual cycle of the human subject and its true relation to ovulation and impregnation are interestingly summarized. The closing chapter of the book deals with pregnancy, parturition and lactation. The book is well illustrated and the author is to be congratulated on describing the salient features of the subject in the compass of a comparatively small volume.

¹ "Light Treatment in Surgery," by Dr. O. Bernhard, Translated by R. King Brown, B.A., M.D., D.P.H.; 1926. London: Edward Arnold and Company. Demy 8vo., pp. 325, with illustrations. Price: 21s. net.

² "The Physiology of the Continuity of Life," by D. Noël Paton, M.D., B.S., LL.D., F.R.S.; 1926. London. Demy 8vo., pp. 236, with illustrations. Price: 12s. net.

The Medical Journal of Australia

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A Retrospect.

Obstetrics.

THE most important item of interest to Australian obstetricians was that part of the report of the Royal Commission on Health which dealt with maternal mortality, maternal hygiene and child welfare. The recommendations of the Commissioners on these matters, already published in full in this journal, are the concern of every medical practitioner.

Paramore has discussed the pelvic floor in relation to parturition and has urged a slow passage and gentle manipulation while the foetus is passing over the pelvic floor.

There have been a number of valuable contributions to the literature of obstetrics during the year. Caesarean section has been dealt with by Donovan. Wawn has reviewed the indications for interference during labour. Marshall Allan wrote on antenatal supervision. Coghlan reviewed the position of forceps in obstetrical treatment, while occipito-posterior positions were the subject of papers by Brown Craig and Gibson. Windeyer has explained with great clearness his methods of abdominal palpation in obstetric diagnosis. By the adoption of this method the practitioner will be enabled to distinguish readily between normal and abnormal positions and will be in a position to eliminate vaginal examinations entirely or to dispense with them to a large extent.

Cunningham has investigated albuminuria of pregnancy, preeclamptic toxæmia and eclampsia. He regards these as different stages of the one condition. He also paid special attention to the urea content of the blood. The amount varies from twenty to forty milligrammes per hundred cubic centimetres of blood. Stander and Radelet can discover no difference between the lactic acid values of the blood of pregnant and non-pregnant patients. They

find that there is a pronounced tendency towards hyperglycæmia in pregnancy. The uric acid content and the lactic acid content of the blood are increased. In certain cases they found that the carbon dioxide combining power of the blood was very low. Hofbauer has paid special attention to the part played by histamine in the toxæmias of pregnancy. McDonagh has put forward the view that the toxæmias of pregnancy and of the puerperium are due to the physical changes occurring in the protein of the plasma.

Phillips has suggested a new line of treatment in puerperal infection by the intrauterine injection of glycerine. He claims that by this means free drainage may be established.

Therapeutics.

Each year the synthetic chemist, the pharmacologist and the pharmacist exhibit ingenuity in the production of a long list of new drugs. The majority of these preparations have little or no therapeutic action. Some are proved to have some physiological effect on the animal organism, but it is not always possible to utilize this action in treatment of disease. In the past year no important therapeutic discovery has been made. Blair Bell continues to claim progress in the medicinal treatment of malignant disease by means of his preparations of lead. The value of his work has yet to be established and this will not be possible until full details of his lead remedies are published and his methods of employing these agents are explained.

In the treatment of pulmonary tuberculosis many old and a few new alleged remedies have been tested. The control is not invariably free from bias. Dixon, a staunch supporter of sanatorium treatment, attacks with great vehemence almost every other method of treatment. He produces acceptable evidence of the lack of all specific action of the coal tar products, including guaiacol and creosote, of perchloride of mercury, of formaldehyde and of a few other drugs in tuberculosis. The clinical improvement that follows the exhibition of guaiacol, calcium salts, cod liver oil and petroleum is due to the indirect action on nutrition. Dixon maintains that tuberculin in all its varied forms has been discredited. There are many com-

petent clinicians who have recorded good results from tuberculin treatment. Moellgaard's "Sanocrysin," the double thiosulphate of gold and soda, has been employed largely. More evidence is required before its true value can be assessed. As it produces a serious reaction at times, caution is needed in the dosage.

Some careful work has been carried out in connexion with the spirochætal infections of the lungs. Arsenic in the form of sodium cacodylate and "Neoarsphenamin" is said to yield good results, particularly when the infection is associated with abscess formation.

Recent investigations have revealed that digitalis has little effect on blood pressure. It is not absorbed from the stomach; it is slowly taken up in the intestine. It is stated that digitalis may be used at times in aortic regurgitation with good result.

"Mercurochrome 220" injected into the veins has been freely used in the treatment of septicæmic conditions. Some observers claim that it is capable at times of effecting an almost complete sterilization of the blood. "Luminal" is yielding good results in the hands of some clinicians, while others claim even better results in epilepsy with "Rutonal." The latter is also a derivative of malonyl-urea. It is said to be less toxic than "Luminal." "Cardiazol" and ephredin, an alkaloid isolated from a Chinese herb *ma huang*, give promise of being useful in cardio-vascular collapse. "Novarsurol" as a diuretic is held to be less irritating to the kidneys than other diuretics.

Collip has demonstrated that parathyroid hormone increases the calcium content of the blood. In virtue of this finding this hormone has been employed in tuberculosis and other pathological conditions as a therapeutic agent. Hitherto but little beneficial therapeutic effect has been noted. It is claimed that extracts of liver tissue when injected into the muscles cause a lowering of blood pressure. Further observations are needed before the use of liver extract can be advocated in the treatment of disease.

Pædiatrics.

The foundations for the health of every individual are laid in infancy. For this reason the most

important chapter in preventive medicine is concerned with the protection of the infant before, during and after birth. The study of the physiology of the normal infant is attracting much attention. Many investigators have been induced to attack the obscure processes of the metabolism of the new-born infant in the hope that as information is accumulated, it will be possible to eliminate those noxes which tend to interfere with the normal growth and development of the child. Antenatal physiology and pathology are not as a rule included in the scope of pædiatrics. In the realm of neonatal study some highly interesting and important work has been carried out in Australia. Southby has collected a considerable amount of data on the weight of infants born in Australia. Hitherto it has been customary to accept the standard figures published in the United Kingdom and in the United States of America as the average weight of healthy infants. While Southby draws attention to the considerable variation in the weight of babies at birth and during the first year of life, he finds that the average weight of Australian infants is distinctly higher than that of infants born in the United Kingdom or in the United States of America at birth and that this higher average weight is maintained throughout infancy and early childhood. He has plotted a curve of the average weight of two thousand Australian babies and compares this curve with another plotted on the basis of the figures supplied by workers outside the Commonwealth. Although it is essential that others should amplify this study and publish the results of the accurate weighing of very large numbers of healthy Australian infants, it is safe to conclude from Southby's observations that the Australian starts life with a definite advantage over his compatriots in the mother country and his distant relatives on the other side of the Pacific Ocean.

The causes of death of infants both during and soon after birth must be understood before material progress in the protection of infant life can be achieved. Hipsley has reviewed this subject and has some newly ascertained facts to register. He found that approximately 7% of the babies born at the Royal Hospital for Women in Sydney were either still-born or died within ten days of birth.

It is generally recognized that little if any improvement has been registered in the mortality of infants at this stage of their existence. Hipsley shows that the main causes of still-birth and of death within a short time after birth are to be sought in the maternal organism. The aetiological factors of eclampsia and the allied conditions and of *ante partum* hæmorrhage either alone or associated with albuminuria act as the causes of death of the majority of these infants. He also traces many deaths to the effects of trauma during difficult delivery. Hæmorrhagic diseases of the infant and syphilis are responsible for some of the deaths. The remedy recommended by him is the extension of antenatal supervision by specially trained medical practitioners and nurses. Margaret Harper has investigated the causation of the death of infants during the first month of life. She found that in New South Wales of the infants who die within the first year of life, approximately one-half die in the first month. Of the deaths in the first month over 73% are associated with prematurity, while the remaining 26% are classified under that ambiguous term debility. She pleads for better training of medical students in infant feeding and infant hygiene, for more specialized instruction of obstetric nurses in mothercraft and for the provision of well equipped rooms in all maternity hospitals for the care of premature children. Vera Scantlebury and H. Main have made an exhaustive investigation into the methods adopted in New Zealand and Victoria to improve the health conditions of women and children. They produce striking evidence of the relation between unfavourable climatic and industrial conditions and a high mortality of infants. In Victoria where the summer temperature is high, with frequent drought conditions and where female labour is much more prevalent than in New Zealand and where the density of the population, particularly in the cities, is much greater than in New Zealand, the infant mortality is relatively high. There has been a steep decline of this mortality in New Zealand during the last fifty years. In thirty years the mortality has decreased by 45%; in Victoria the decrease has been less regular, but in the past thirty years it has been steeper than in New Zealand, the drop representing about 55%. They

recognize the value of the work of the Plunket system in New Zealand which was introduced in 1907 and in Victoria in 1920, but from the mortality curves it does not appear that the drop has been more rapid since the establishment of the societies than before. They recommend that the government and the local authorities should assume full responsibility for the welfare of infants and should make sufficient provision for the appointment of a director of child welfare and of a staff of specially trained nurses, for the maintenance of baby health centres and for educational work.

In regard to infant feeding Wardlaw, Dart and Stephens have published the results of analyses of the mammary secretion of one hundred and twenty healthy women of Australian birth and European stock. They determined the modal values not only of the fat, lactose and protein content of the milk, but also of the freezing point depression, the specific gravity and the ash. It is remarkable that, while the average protein, fat and lactose contents of 1.40%, 5.30% and 6.45% respectively do not differ greatly from the figures published in other countries, the variations are much greater than are usually accepted. The extreme values are 2.33% and 10.29% for fat, 0.44% and 2.83% for protein and 4.9% and 7.2% for lactose. But even if the upper and lower quartiles are taken, the variability is so great as to render the attempt of the health authorities to standardize infants on the basis of an alleged standard composition of milk futile and foolish. H. D. Chapin has reported on the progress of the distribution of human milk on commercial lines in New York. The milk is pooled and samples are taken each month for analysis. In view of the many difficulties in handling and distributing the milk, the author suggests that it would be wiser to dry the milk according to the method of Emerson and Smith.

E. Cassie and U. Cox have ascertained that infants in health secrete sufficient hydrochloric acid to render the acidity of the gastric contents, as determined by hydrogen ion concentration, constant after feeding with artificial food or with mother's milk. They do not consider it necessary to administer acid milk mixtures to raise the hydrogen ion concentration. On the other hand lactic acid milk

seems to possess a definite curative value in chronic enteritis. Hess, Koch and Sennewald have arrived at similar conclusions.

C. H. Carlton had carried out some interesting work with transfusion of blood. This expedient has apparently the same therapeutic value in children as in adults. It is useful for shock and hæmorrhage and also after burns or scalds. It is of doubtful value in septicæmia. Exsanguination transfusion may prove directly life saving in the toxæmic condition following burns.

A special report on rheumatic infections in children was published by a committee appointed by the British Medical Association. R. Miller has come to the conclusion that two-thirds of rheumatic infections occur in damp houses. He attaches importance to heredity, poverty and tonsillar infection as ætiological factors. The committee recommends a discriminative use of the operations of tonsillectomy for the prevention of rheumatic infection.

Orthopædic Surgery.

A very great deal has been written on the subject of tuberculosis of bone and joints. R. M. Downes has dealt exactly with the recognition of bone and joint tuberculosis and H. S. Newland has also drawn on his experience to distinguish tuberculous from other lesions of bone, joints and spine. H. C. Trumble has drawn a clear picture of the successive stages of Pott's disease and describes the effects of treatment. In regard to the treatment of tuberculosis of joints it is now held that the aim of the surgeon should be to obtain ankylosis in a good position. It is inadvisable to attempt to give the patient a movable joint. Hibbs and others have practised fusion of the knee joint. This shortens the course of the active disease and yields better permanent results. Hibbs has further devised an operation for the fusion of the hip joint by transplanting the trochanter with its periosteum and muscle attachments into the ilium. The limb is brought into a position of flexion and abduction. Smith-Petersen and Rogers have applied the same principle to the treatment of tuberculosis of the sacro-iliac joint with satisfactory results.

The operation of synovectomy has been suggested for certain forms of arthritis. J. A. Key has car-

ried out an investigation into the behaviour of joints after the removal of synovial membrane. He found that the function of the joint was not impaired a few days after the operation and that no limitation of movement resulted. Connective tissue proliferates and forms a new synovial membrane which can be distinguished from that of a normal joint only with difficulty.

J. Buchman has drawn attention to vertebral epiphysitis as a cause of spinal deformity. K. Stuart Cross has demonstrated by radiographic means that *spondylitis deformans* begins as a lesion of the spinal ligaments. Calvé's disease of the spine has to be considered in connexion with spondylitis.

Children suffering from Perthes's disease are shown at clinical meetings of the several Branches of the British Medical Association in Australia. The pathology of this condition is still obscure. Some interesting speculation concerning the cause has been brought forward. J. M. Berry suggests that there is a partial arrest of development. He explains that if the arrest of development takes places at the reptilian stage, an imperfectly formed, shallow acetabulum and a small malformed head of the femur would result.

Sandes, Vance and Campbell have dealt with fractures and dislocations of the spine from the clinical, operative and neurological points of view. The importance of defining what is known as spinal shock and of recognizing the occurrence of complete spinal lesions has been brought out by Campbell. W. H. Cole has made observations in twenty children with fracture of the femur. In fourteen of these children there was no shortening one year after the fracture, while in three the amount of shortening varied between six and eighteen millimetres. Cole concluded from this that compensatory lengthening of the femur takes places in young children after fracture. This lengthening may occur as late as two years after the injury. There is therefore no need to undertake operative reduction for fractures of the thigh in children.

C. C. Garr has issued a warning in regard to the use of bands in the treatment of fracture. He has encountered two patients in whom bone bands had been properly and neatly applied. Fracture occurred later as a result of muscular action.

Ophthalmology.

At the eighteenth meeting of the Australasian Association for the Advancement of Science the subject of the training of opticians was discussed in the Section of Astronomy, Mathematics and Physics. The Council of the Association has adopted a procedure which may have far-reaching results. It has admitted to membership of this scientific section spectacle makers who describe themselves as optometrists. It is surprising that the Australasian Association for the Advancement of Science should have ignored the opinion of the highest authorities in the British Empire on the subject of ophthalmology, the Ophthalmological Society of Great Britain, the British Medical Association, the several Branches of the British Medical Association in Australia and every other body concerned with the defects and diseases of the eye. This opinion is that it is unsafe to permit makers and vendors of lenses who have no training in general physiology and in medicine, to test eyesight, in view of the fact that they are obviously incapable of distinguishing between visual defects dependent on developmental anomalies of the eye and those caused by pathological conditions, many of which are not primarily localized in the eye. If this action be followed to its logical conclusion motor mechanics will be admitted to membership of the Section of Physics and cooks will be permitted to read papers before the Section of Physiology on the preparation of food in temperate climates.

J. M. West has devised an intranasal operation for the treatment of lachrymal disease and claims success in 90% of his patients. He states that his method is suitable in all types of lachrymal disease, even in those with suppuration and fistula. Other surgeons have failed to achieve like success and rhinologists evince no enthusiasm for the operation.

W. S. Duke-Elder has published the results of some experiments devised for the purpose of estimating blood pressure in the retinal vessels of animals by direct measurement. These direct measurements are the first that have been made. He determined that the retinal blood pressure of a cat

was seventy-five millimetres of mercury. The pressure in the intraocular veins is always greater than the intraocular pressure. He has criticized the work of Magitot and Bailliart who have claimed that they were able to estimate the tension in the retinal arteries by an instrument which records the external pressure on the globe necessary to produce visible pulsation in the arteries and the extra pressure required to arrest the blood flow. Duke-Elder maintains that these records do not represent the measurements of the retinal blood pressure, but are those of the blood pressure of the ophthalmic arteries. The same observer has employed injections of hypertonic solutions in glaucoma to reduce the tension by altering the osmotic condition of the blood. One cubic centimetre of a 30% salt solution for each kilogram of body weight was slowly injected into a vein. The method is not free from danger and the effect is but temporary.

A. E. Davis has continued to treat patients with cataract by injection of lens protein. The lens is used as an antigen. The treatment extends over several months. Davis records that improvement was achieved in 65% of the patients. H. Smith has added a new manoeuvre to his technique of intracapsular extraction. His aim is to deliver immature and hard lenses as "tumblers." This is effected by applying pressure on the wound by the flat of a spoon while pressure is exercised with the hook just below the cornea.

There seems to be a rebellion against the old method of treating juvenile cataract by needling the capsule and repeating the operation *ad nauseam*. Ziegler advocates his V-shaped incision through the substance of the lens. G. H. Bell performs a preliminary iridectomy and later a Ziegler's discission of the lens, followed if necessary by incision into the cornea and irrigation.

H. F. Shorney has contributed a very useful article to this journal on protein therapy in eye affections and has shown that good results may be obtained by injections of milk in gonorrhœal ophthalmia and perforating wounds of the globe. L. Paton has contributed a scholarly article to literature on herpes and *herpes zoster ophthalmicus*. His account on these conditions is authoritative.

Abstracts from Current Medical Literature.

MEDICINE.

Blood Letting.

A. LEMIERRE and E. BERNARD (*La Presse Médicale*, June 5, 1926) discuss their researches on the indications and physiological action of bleeding. Bleeding is a purely symptomatic treatment, of especial use in paroxysmal dyspnoea and eclampsia and in renal disease associated with cardiac inefficiency. When the heart fails, venous blood pressure is raised and bleeding (five hundred to one thousand cubic centimetres) always lowers the venous pressure; if the pressure remains low, prognosis is good and *vice versa*. The relief to the circulation allows the tissues to rid themselves of oedema, the fluids being taken up into the blood stream in order to replace the blood lost; all organs function better and diuresis occurs when the blood ceases to stagnate in the kidneys. Acute pulmonary oedema associated with arterial hypertension or mitral disease is quickly relieved by bleeding, apparently owing to the relief afforded to the auricles. In heart failure the arterial tension is variably affected by bleeding, generally there is little fall in arterial tension even when the patient is greatly relieved. When the blood pressure is high *per se*, only a copious blood letting (one thousand to one thousand five hundred cubic centimetres or more) will cause a fall in blood pressure of any duration; too copious bleeding may cause syncope. It is doubtful whether blood letting is a justifiable method for permanently high blood pressure, but it is the most suitable procedure in the paroxysmal dyspnoea associated with high blood pressure and in eclampsia. Morphine appears to be helpful also. When there is retention of chlorides without heart failure, bleeding does little good, nor is it efficacious in pure uræmia; but it often has a beneficial effect when convulsions occur in nephritis or in hypertension possibly by relieving vascular spasm as well as by allowing the heart satisfactorily to maintain the circulation.

Treatment of Multiple Sclerosis by Fever, Especially Malaria.

G. L. DREYFUS and R. HANAU (*Deutsche Medizinische Wochenschrift*, February 26 and March 5, 1926) publish conclusions arrived at after infecting twelve patients suffering from multiple sclerosis with a malarial vaccine. A course of twenty injections was given extending over a period of eight to ten weeks. In no case was there any alarming sequela and the results were unquestionably better than those of a series treated with typhus vaccine. Of the twelve only one remained unaltered, nine were definitely improved and two greatly

improved. In one patient the paræsthesia disappeared and in addition he was able to feed himself again. Others were able to write again and to dress their hair after being unable to do this for years. Two patients who for some time had been unable to walk without the help of two sticks, were discharged after three months' treatment so much improved that they were able to climb up stairs again and to walk for a short time without a stick. This improvement was maintained some months later, with one exception. The success of the method is ascribed to the powerful reaction of the whole system after overcoming the implanted malaria, the reaction being so strong that the original sclerosis is improved as well. The authors warn against hoping for success in longstanding cases when the patients are totally unable to walk. On the other hand patients who for years have had definite spastic disturbance of gait, may react favourably.

Upper Respiratory Infections as a Cause of Cholera Infantum.

P. C. JEANS and M. L. FLOYD (*Journal of the American Medical Association*, July 24, 1926) have observed that in early childhood (from four weeks up to one and a half years of age) the general disturbances, commonly thought to be due to *cholera infantum*, are frequently a mask for some severe infection of the middle ear, mastoid antrum or paranasal sinuses. The respiratory infection is seldom obvious; the gastro-intestinal symptoms with the accompaniments of rapid loss of weight, profuse diarrhoea and signs of intoxication form the salient features of the picture. The establishment of adequate drainage from the site of the infection brings rapid and complete recovery.

Blood Sugar Studies in Encephalitis Lethargica.

P. K. McCOWAN, J. S. HARRIS and S. A. MANN (*The Lancet*, April 1, 1926) have investigated a series of blood sugar curves following the ingestion of fifty grammes of glucose. The tests were made in the mornings, following a twelve-hour fast, the values being determined at stated intervals up to two and one-half hours following the ingestion. It has been held that an increase of sugar in the cerebro-spinal fluid is diagnostic of postencephalitic conditions, but the present workers controvert this opinion. A constant ratio exists between the fasting blood sugar level and the sugar of the spinal fluid, but there is no characteristic increase of sugar in the cerebro-spinal fluid of fasting postencephalitic patients. An increased blood sugar and spinal fluid value may occur, but is not characteristic of the disease and such findings have no diagnostic value. There is in conditions following *encephalitis lethargica* a definite upset of carbohydrate metabolism, as shown by blood sugar curves. The lævulose test does not support the statement that per-

manent hepatic insufficiency occurs in this disease. Most patients, however, manifest a hyperglycæmia after glucose ingestion and this is unduly and considerably protracted in 50% of cases. Depression and stupor seem to march hand in hand with abnormalities of the carbohydrate metabolism, but no very definite correlation is observed between the clinical pictures and the types of blood sugar curves obtained. It is noteworthy that the only patient of the series observed who had recovered from his psychoses, was the only one exhibiting a normal curve. The hyperglycæmia is in keeping with the view that *encephalitis lethargica* is in the nature of a toxæmia, acute in its onset and tending to become chronic in type.

Hepatic Extract.

R. H. MAJOR (*Journal of the American Medical Association*, July 31, 1926) records observations on the action of hepatic extract in hypertension. The extract of liver was prepared by alcoholic fractionation, the depressor substance being thrown down as a precipitate. This liver extract when injected caused a fall of blood pressure in animals in which the pressure had been raised by injections of methyl-guanidine (a normal constituent of urine). The action of liver extract was unlike that of histamine (to which its depressor action might be attributed) in that it was slow and prolonged in its depressor effect, it would not depress normal blood pressure and it would not produce contractions in smooth muscle. Histamine acts in the opposite way in all these conditions. It was found that methyl guanidine raised the blood pressure of animals; a dilute solution of methyl guanidine sulphate was injected in the femoral vein of an animal until blood pressure was raised twenty millimetres or more. Hepatic extract was then introduced into the other femoral vein. The unit employed was the amount of hepatic extract necessary to neutralize 0.1 milligramme of guanidine in an animal weighing 2.5 kilograms. One hundred patients with high blood pressure were treated. Those in whom hypertension was of some years' duration, did not benefit; those with hypertension of recent origin often manifested good results; improvement in symptoms was striking in many cases. The author concludes that liver extract is effective in certain cases of hypertension.

Subacute Combined Degeneration of the Spinal Cord.

D. A. MACERLEAN (*Irish Journal of Medical Science*, July, 1926) points out that subacute combined degeneration of the spinal cord is referable to the posterior and lateral columns of the cord and is associated with severe anemia and cachexia. An examination of the nervous, hæmatopoietic and digestive systems is necessary. Profound changes are found in the gastro-intestinal canal, notably in relation to

gastric secretion. Degenerative lesions are found in the posterior and lateral columns of the cord, but without any neuroglial increase. The white matter bears the brunt of the attack, the grey matter escaping, unless mechanically encroached upon. The disease tends to spread up and down the cord until the entire white matter is involved and becomes a grey, translucent mass. The blood changes seem to prove a close relationship between the disease and pernicious anaemia. Sooner or later the anaemia appears and it is undoubted that the anaemia and the nervous degeneration are evidence of the same disease. So constant is achlorhydria in the disease that free hydrochloric acid in any fraction of a test meal is a strong point against the diagnosis of subacute degeneration. The commonest subjective symptoms are tingling or "pins and needles" in hands and feet of the "glove and sock" type. Muscle and joint senses are defective and thermal sensation is impaired. Spasticity and ataxia are prominent. The sensory symptoms of true tabes (lightning pains, sensation as of walking on cotton wool) are absent. Loss of sphincter control occurs in the terminal stages. The disease is one of adult life. Syphilis is not a factor. Gastric disturbances are common in the early stages and may be predisposing. Various hæmolytic streptococci and bacteria have been found in the duodenal contents of patients suffering from the disease. Of these organisms, one (*Bacillus welchii*) is excreted in great numbers in the faeces in pernicious anaemia. The absence of free hydrochloric acid from the stomach is invariable in patients with combined degeneration of the cord; it is supposed that the antiseptic and antibacterial properties of the gastric secretions are thus reduced and permit the passage of living organisms into the intestine, where they find conditions favourable for the production of toxins. The secretion of hydrochloric acid by the stomach is a defence against infection; weaker concentrations than that of normal gastric juice are inhibitory to bacterial growth, especially to that of streptococci. Oral administration of hydrochloric acid is known to have caused the disappearance of streptococci from the duodenum of a patient suffering from pernicious anaemia. In the treatment of combined degeneration of the cord all possible sources of infection must be dealt with (teeth, tonsils *et cetera*). Hydrochloric acid is administered daily and an attempt is made to combat the anaemia by the use of preparations of iron and arsenic.

Significance of Achlorhydria.

W. F. CHENEY (*Journal of the American Medical Association*, July 3, 1926) states that to demonstrate the presence of achlorhydria, fractional gastric analysis must be carried out for at least two hours after a test meal. The association between pernicious anaemia and achlorhydria has long been recognized. It is constant

and the acid is lacking before the blood picture is characteristic. Whenever persistent achlorhydria is discovered, the possibility of pernicious anaemia should be remembered, even in the absence of confirmatory signs. Moreover, pernicious anaemia should not be diagnosed in the absence of achlorhydria. Cancer of the stomach has always reached an advanced stage before achlorhydria is pronounced. The growing neoplasm by the production of toxins and the destruction of secretory cells has a grave inhibitory effect, but complete anacidity is a late, almost terminal feature. It is a fatal error to conclude that cancer of the stomach cannot be present because free hydrochloric acid is found. Fractional analysis, however, does reveal decreases in secretion and motor power and so directs attention to interferences with important gastric functions. In all cases of chronic gastric disorder radiographic investigation is necessary and gives indubitable proof of the presence of the condition. The achlorhydria of chronic gastritis is associated with the presence of abundant mucus in the fasting contents; bad triturations after an Ewald test meal, the presence of fragments from a previous meal and the presence of mucus practically establish the diagnosis, especially with a history of dietetic indiscretions or in association with conditions producing stasis of the gastric circulation, such as hepatic cirrhosis or heart disease. There is a definite relationship between achlorhydria and chronic disease of the gall bladder. It has been asserted that a hormone produced in the biliary tract or duodenum is a necessary stimulant for the production of acid by the gastric mucosa and that this substance is destroyed by disease of the gall bladder. But so far no hormone has been demonstrated and gall bladder disease does not always result in achlorhydria. After removal of the organ achlorhydria rarely ensues. The stomach and gall bladder have a common innervation and that which impairs the function of the one, might be supposed to depress the function of the other. But this is not so and although about 50% of patients with gall bladder disease show the absence of the acid, the two conditions are not constant associates. The probable explanation (von Alden's) is that cholecystitis is not uncommonly associated with chronic gastritis; in a certain proportion of such cases the gastric secretion may be deficient or devoid of acid and frequently recovers its normal strength after the removal of a diseased gall bladder. Achlorhydria is found in all cases of combined sclerosis of the cord; it is as invariably present as in pernicious anaemia, a disease of which the nervous symptoms are remarkably similar. Every patient whose gastric secretions contain an absence of acid, may therefore be regarded as a candidate for one or other of these two diseases. The neuroses accompanying Glenard's disease constitute a group of cases in which nothing will explain the absence of hydrochloric

acid except a disturbance of innervation. In such cases, if the stomach motility remain normal, all serious symptoms may be absent. The same condition of affairs obtains in neurasthenia due to worry, overwork *et cetera* and in hysteria. But although the absence or deficiency of the acid may be purely functional, the defect must be considered as the possible herald of serious changes in the blood or nervous system and as permitting the development of dangerous toxins in the intestinal tract. No normal individual suffers from achlorhydria and its discovery is not a matter for complacency.

Biochemistry of Calcium.

A. T. CAMERON (*The Canadian Medical Association Journal*, July, 1926) discusses the biochemistry of calcium. Calcium is an element essential to life. Animals obtain it from plants which in turn absorb it from the soil as calcium carbonate or phosphate. The green parts of plants are rich in calcium, seeds, roots and tubers are not. Man requires 0.4 to 0.8 grammes of calcium per day, children relatively more. Calcium is absorbed from the intestine as a mixture of inorganic salts and calcium ions; it is excreted in faeces, urine and bile. Calcium occurs in animals in bones and supporting tissues, circulating fluids and other tissues to a less extent. Red blood cells contain none; the plasma or serum of the blood contains ten to eleven milligrammes per hundred cubic centimetres in organic and inorganic form and as calcium ions. Other tissues contain 6.5 milligrammes (muscle) to 33.7 milligrammes (thyroid gland) per hundred grammes. Bone contains 10,000 milligrammes per hundred grammes. Cow's milk contains 120 milligrammes and human milk thirty to eighty milligrammes per hundred cubic centimetres. Calcium ions of the blood and tissues form part of a balanced system of ions which control the irritability of all muscles and nerves and hence control correct function of the beating heart, contracting muscle and functioning nerve. Diminution of calcium ions lessens the irritability of tissues. Changes in the ratio of calcium ions to potassium hydroxyl, magnesium or hydrogen ions may cause diuresis or oedema or affect carbohydrate metabolism. Calcium ions are necessary for the formation of thrombin and hence for blood clotting. Delayed clotting in jaundice may be due to removal of calcium ions by union with bile salts. In hæmophilia there is no calcium deficiency, though intravenous calcium chloride is said to have given good results. Calcium is necessary for clotting of milk, calcium caseinate forming the clot mesh. It has been shown that in adults bone may lose some of its calcium in disease and in pregnancy if the mother has a diet deficient in calcium she yields calcium from her own skeleton for the child. Calcification about diseased tissue (as in tuberculosis) is merely mechanical.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held in the Medical Society Hall, Albert Street, East Melbourne, on October 6, 1926, Dr. H. Douglas Stephens, the President, in the chair.

Cholecystitis and its Complications.

MR. ALAN NEWTON read a paper entitled: "Cholecystitis and its Complications" (see page 69).

DR. J. R. BELL congratulated Mr. Newton on his extremely able and lucid demonstration. He remarked that there seemed to be a general tendency to over-emphasize the infective factor in considering the pathogenesis of gall bladder disease. He therefore wished to draw attention to the importance of disturbance in cholesterol metabolism as a factor, without, of course, implying that the infective factor could be ignored.

Almost all gall stones were formed largely, if not entirely, of cholesterol and it was his experience that the blood and bile of the majority of patients with cholecystitis or cholelithiasis contained an excessive amount of cholesterol. The cholesterol content of the gall bladder bile was usually much higher than that of the blood. The average normal value for the blood was 0.160%, while that for the bile was a less constant figure, but was approximately 0.300%. The gall bladder bile in a large series of *post mortem* determinations showed an average cholesterol content of 0.321% when the gall bladder was normal and an average value of 0.433% when gall bladder disease was present. His own figures for the blood cholesterol obtained in two groups of patients in whom the gall bladder was normal and diseased, were 0.158% and 0.213% respectively. The state of the gall bladder, healthy or otherwise, was recorded on the findings at operation. These figures closely approximated those quoted by Moynihan in 1925.

It was his experience that in about two-thirds of all persons affected with gall bladder disease the blood cholesterol value exceeded 0.190%; in the remaining one-third the figure was normal or perhaps slightly raised. When it was realized that the cholesterol content of the blood was usually normal or subnormal in those abdominal diseases which so frequently simulated affections of the gall bladder, the value of blood cholesterol estimations as an aid to accurate diagnosis was apparent.

Investigations of the gastric acidity by means of the fractional method had shown that free hydrochloric acid was absent or greatly deficient in about half the cases of gall bladder disease. His figures were, approximately: Achlorhydria, 30%, hypochlorhydria 20%, normal 30%, hyperchlorhydria 20%.

The old view that gall stones were usually associated with hyperchlorhydria was largely based on inaccurate clinical diagnoses unconfirmed by operation—unreliable data which he feared had led to much misconception in the past.

MR. BALCOMBE QUICK congratulated Mr. Newton on his masterly exposition of the subject of the surgery of the gall bladder and bile ducts. Dr. Bell had presented the subject of the biochemical factors involved in the formation of gall stones in a most interesting manner. He had no paper prepared for the purpose of contributing to the discussion and hoped that his remarks would not be too fragmentary and disjointed.

Mr. Newton had shown some very interesting slides illustrative of anatomical abnormalities in the biliary system, but he thought that he would probably agree that considering the comparative frequency of such abnormalities recorded from the dissecting room it was surprising how small a factor they were in the surgery of the gall bladder. In the case of the patient described by Mr. Newton in whom a surprise discharge of bile occurred in spite of the facts of which he was confident, that there had been no damage to the bile ducts and that the ligation of the cystic duct was secure, he would suggest that there had been some unnoticed abnormality.

Mr. Newton had commented upon the lack of precise knowledge regarding the functions of the gall bladder. Cystographic methods had failed to show conclusively that peristalsis occurred in this viscus, but in experimental work upon dogs it had been demonstrated graphically by manometric methods that peristalsis occurred in relation to the intake of food and was modified by changes in the nature of the food.

In discussing the part played by bacterial infection in the origin of gall stones Mr. Quick said that the issue did not appear to be so clear cut as indicated in the formerly accepted dictum of Moynihan that every gall stone was a tombstone erected over the bodies of dead bacteria. That cholecystitis was invariably due to bacterial infection had also been for a long time a generally accepted view. These conceptions would seem to require modification in view of the results of a series of bacteriological examinations of the bile, gall stones and wall of the gall bladder carried out at the instance of Judd, of the Mayo Clinic. In a large proportion the cultures remained sterile, the positive findings recorded in the examination of the bile being 10% of the total and of gall stones 5% only. In giving these figures he was speaking from memory. From the fact that the intravenous injection of "Eusol" sometimes occasioned acute cholecystitis, it seemed likely that other substances in the blood, apart from bacteria, might act in the same way.

He was satisfied that it was often impossible to make the differential diagnosis between cholecystitis and cholelithiasis, but this was not a matter of any practical importance, as surgical measures were indicated in either case.

Mr. Newton had remarked that symptoms attributed to systemic toxæmia dependent on the gall bladder as the focus of infection were commonly not removed by the extirpation of the gall bladder and had instanced the case of a patient who suffered from migraine. Surgical removal of an undoubtedly diseased gall bladder was not followed by relief of the migraine. Mr. Quick had had a similar experience with a patient, a subject of migraine who manifested symptoms of cholelithiasis also. At the operation—cholecystectomy—a stone had been found in the cystic duct and the bile was purulent. The patient was completely relieved of symptoms due directly to the gall bladder disease, but the headaches persisted as badly as ever. In another patient who was prone to attacks of *angina pectoris* associated with myocardial degeneration, the hopes of the physician that drainage of the gall bladder would benefit the patient had not been realized.

He was in agreement with Mr. Newton on the advantage to be gained by the use of ethylene anaesthesia in operations upon the bile passages on the ground that ethylene was much less likely to be detrimental to the liver function than chloroform or ether.

In his discussion of the relative merits of cholecystostomy and cholecystectomy Mr. Newton appeared to favour cholecystectomy wherever possible and to have carried this operation further than had been his (Mr. Quick's) practice in the past. In view of Mr. Newton's results he felt bound to reconsider the position, but hitherto he had often felt it to be the part of wisdom to play for safety. For example, in the case of a stout elderly woman, a bronchitic subject, in whom it was necessary to deal surgically with an acutely inflamed gall bladder with many adhesions and perhaps a stone in the common duct, he had been satisfied to remove the stone and secure drainage of the gall bladder with all possible expedition. Operation on jaundiced patients was always attended by anxiety on account of oozing of blood and cholecystostomy had the advantage that it occasioned less trauma and consequent liability to hæmorrhage than cholecystectomy. Whenever he deemed it advisable in such a case to do no more than drain the gall bladder, he made it a point to warn the patient that it was possible that removal of the gall bladder would have to be undertaken at a later date.

Continuing, Mr. Quick said that there were apparently two causes for the attacks of pain which occasionally occurred after cholecystectomy, always provided, of course, that disease of the gall bladder and biliary passages had been the correct diagnosis in the first instance. It was

necessary to remember in the first place the possibility that a stone in the common duct had been overlooked. In such an event the pain would probably be accompanied by jaundice, chilliness and rise of temperature. In the second place pain might be occasioned by spasm of the sphincter of Oddi, in which case relief would be afforded by dilatation of the common duct and division of adhesions around it.

He cordially agreed with Mr. Newton in his insistence upon the necessity for a thorough exploration of the abdomen even when gall stones were present.

On the subject of cholecystography Mr. Quick said that experience at the Alfred Hospital had not been altogether satisfactory. Inquiries he had made on a recent visit to the United States suggested that the disappointing results were probably due to deterioration of the sodium-tetra-iodophthalein. At Rochester the rule was that radiograms of diagnostic value were obtained in 89% of patients with cholelithiasis and in 70% of those in whom cholecystitis existed without stones. The sodium-tetra-iodophthalein was always administered by the mouth.

Mr. Quick proceeded to discuss points in operative technique. The incision must be adequate. He often employed the rectus reflecting incision described by Mr. Newton, but more frequently one through the inner third of the rectus itself. The manoeuvre of division of the suspensory ligament of the liver with traction upon the lower portion by the clamp holding it was of very great value in securing good exposure of the ducts. He was glad to hear Mr. Newton advocate drainage after cholecystectomy. On this point it seemed to him that the practice of Judd at the Mayo Clinic was rather unusual. Judd appeared to be ready to dispense with drainage on the least excuse. It was necessary to bear in mind the possibility of an unexpected escape of bile such as Mr. Newton had described, a contingency which involved very serious risks for the patient.

With regard to Mr. Newton's statement that he had once witnessed wholesale tearing of the liver by the assistant surgeon in making traction upon the organ Mr. Quick mentioned recent experimental work in the United States by which it was observed that a portion of liver left within the peritoneal cavity of a dog gave rise to a rapidly fatal type of peritonitis very similar to that accompanying acute pancreatitis.

He wished Dr. Bell had said more relating to the assistance which physicians could give surgeons in the diagnosis of gall bladder disease. There was no condition in which the physician could be of greater help and the whole subject was one particularly well suited for combined debate. He had in mind the information to be gained from studies in liver function and the Van den Bergh test, the latter apparently being of definite diagnostic and prognostic value. The intravenous injection of calcium chloride, an effective prophylactic measure against post-operative hæmorrhage in jaundiced patients was an outcome of studies in blood chemistry, as was also the demonstration of the great value of the intravenous injection of a solution of glucose in the grave toxæmia which it was often necessary to combat after operation for the relief of obstruction in the common bile duct.

That "Urotropine" had been widely employed with a view to sterilization of the contents of the gall bladder was a matter of common knowledge. The most recent attempts in this direction had been made with "Mercurochrome." It had been shown that this drug in non-lethal doses was effective experimentally *in vitro* and *in vivo* in sterilizing the contents of the gall bladder.

In conclusion Mr. Quick tendered his thanks to Mr. Newton and complimented him upon his truly admirable presentation of the subject.

Dr. J. L. DIGGLE said that he had recently been engaged upon an analysis of the results of operations upon the gall bladder at the Alfred Hospital during the last three years.

The figures he was about to supply related exclusively to patients in whom the diagnosis of cholecystitis, gall stones or other pathological condition of the biliary system had been confirmed by operation and there were altogether one hundred and eight patients for whom either cholecystostomy or cholecystectomy had been performed.

Of these eighty-seven were females of an average age of forty-four years and twenty-one were males whose average age was fifty years. A girl of eighteen was the youngest in the series.

It had surprised him that according to the statistics of the Melbourne Hospital as given by Mr. Newton cholecystostomy had been performed 246 times as against 278 cholecystectomies. In the Alfred Hospital series there were four cholecystectomies to every one cholecystostomy.

A history of enteric fever as an ætiological factor was obtained in only six cases of the series.

The symptomatology had been very constant, a high percentage of correct diagnosis, as shown by the subsequent operation, having been reached by consideration of the clinical history, palpation and X ray examination. Jaundice had been manifested by 40% of the patients.

As providing points in the differential diagnosis it was interesting to note that in four patients who were brought to operation as suffering from biliary colic, no abnormal condition was detected; in four others the diagnosis of acute cholecystitis was not sustained by operation and no other pathological state in this region was found. In three patients diagnosed as suffering from cholelithiasis, hydropnephrosis, hydatid of the liver and amœbic abscess of the liver were found respectively. Gangrene of the gall bladder was found in two patients in whom the operation was undertaken for acute appendicitis and in five a previous operation of appendicectomy had been performed outside the hospital for the relief of symptoms which were subsequently shown to be due to gall stones.

Recurrence of symptoms was noted in seventeen of the patients who submitted to operation, but it was to be observed that in sixteen of these the operation had been cholecystostomy and in only one cholecystectomy. The sequelæ were as follows:

(i.) Recurrent acute cholecystitis, no stones; (ii.) stone in cystic duct; (iii.) stones in the gall bladder; (iv.) empyema of the gall bladder; (v.) persistent sinus, nine stones found in the gall bladder; (vi.) stones in the gall bladder; (vii.) persistent sinus, cause undetermined; (viii.) chronic cholecystitis; (ix.) three stones in the common bile duct; (x.) stones in the gall bladder, four and a half years after cholecystostomy; (xi.) stones in the gall bladder; (xii.) purulent cholecystitis; (xiii.) stones in the gall bladder, six years after cholecystostomy; (xiv.) stones in a very contracted gall bladder; (xv.) recurrence of cholecystitis, gall bladder removed; (xvi.) stone in common bile duct, eight months after cholecystostomy.

In the case of the only patient in whom symptoms recurred after cholecystectomy it was found that a stone had been left in the stump of the cystic duct. The stone had been removed and the patient was completely relieved.

The average stay in hospital after cholecystectomy was twenty-two days, after cholecystostomy thirty days.

Dr. J. F. WILKINSON said that after hearing Mr. Newton all were bound to agree that the operation of cholecystectomy was a very brilliant success, provided it were carried out under suitable conditions.

In the first place it was necessary for them to make up their minds when operation of any sort was indicated in chronic dyspepsia, a condition in which they were looking more and more to the gall bladder as the seat of the disease process. Mr. Newton had quoted instances in which no amelioration of symptoms had followed appendicectomy. He sincerely hoped that tenderness in the region of the gall bladder would not become an indication for the routine removal of this viscus as it had so often in the case of the appendix. He hoped further that the days were past when tenderness in the right iliac fossa was to be taken as a sufficient indication for appendicectomy. There were many causes for such tenderness other than a pathological state of the appendix, but time would not permit of their discussion.

In the interpretation of tenderness as indicative of cholecystitis it was necessary to be sure that the tenderness and the position of the gall bladder corresponded. He recollected one jaundiced patient who had been tender in the right hypochondrium and in whom the gall bladder was found on the left side of the abdomen—a transposition of viscera. In another patient cholecystography

had revealed that the gall bladder was not in the position where the tenderness was elicited.

He was confident that cholecystography would prove a valuable adjunct in diagnosis. In the course of a recent visit to the United States he had had opportunity to observe the extended use of this procedure. Case at Battle Creek claimed 100% successful diagnostic results. This distinguished radiographer administered the sodium-tetra-iodo-phthalein by intravenous injection exclusively and was seldom troubled by severe reactions. When such occurred the probabilities were either that the salt had deteriorated or, as in the case of the intravenous injection of arsenicals the fault lay in the distilled water. Great care should be taken to use water double-distilled from glass vessels and freshly prepared; also that in making the intravenous injection there was no escape into the tissues.

Cholecystography, properly carried out, should prove of enormous value. If no shadow were obtained, the observer could be sure of the existence of some pathological condition which required operation. The data supplied by delay in emptying of the gall bladder, especially after a fat meal, were also important. The viscus should empty itself in three or four hours and failure to do so was suggestive of impaired function of the wall.

In order to avoid errors in the interpretation of the picture it was important that a radiogram should be taken before the drug was given. In a recent experience of cholecystography a film taken before the administration of the drug had revealed a shadow thrown by the gall bladder and such shadow was not modified by giving sodium-tetra-iodo-phthalein. It had been found subsequently at operation that the gall bladder was thick walled and shrunken and that a stone was impacted in the cystic duct. No dye had entered the gall bladder, but the outline of the viscus could be traced in the radiogram.

For practical purposes results in cholecystography were almost as good when the sodium-tetra-iodo-phthalein was given by mouth as by intravenous injection. The oral administration had been strongly advocated at the Annual Meeting of the Gastro-Enterological Society of America recently held in Atlantic City. The only drawback was the possibility of the capsule passing to the lower bowel without dissolving and it had been sought to overcome this by placing the capsule containing the drug inside another which contained bicarbonate of soda. The alkali was designed to protect the capsule against the gastric juice which occasionally reacted with it in such a manner as to render it insoluble. It was suggested that it might be wise to confirm the failure to show the gall bladder after the drug was given by mouth by repeating the examination after an intravenous administration.

Dr. Wilkinson said that in his opinion the findings in the estimations of the blood cholesterol in cholelithiasis carried out by Dr. Bell were significant. It was interesting to note that the figures obtained in their own laboratory in Melbourne by Miss Cowen corresponded with those recorded by Dr. Bell in his work at Leeds some years previously.

With reference to the use of the test meal Dr. Wilkinson said that he had recognized achlorhydria in cholecystitis since before 1911 and added that he had made this observation by means of the old one hour test meal. He urged that the one hour meal, although it did not aim at such detailed information as was anticipated from the fractional test meal, was still of value, especially to busy practitioners. Indeed in the majority of patients the one hour test meal would supply all necessary information.

The Van den Bergh test was of undoubted utility in that it would often detect jaundice before it was apparent in the skin or urine and further provided a valuable guide in the consideration of the best time to operate. He had heard Walters maintain at Atlantic City that operation should not be undertaken until the bile pigments in the blood became stabilized and that if the Van den Bergh test revealed a rising or falling bilirubin content, the patient would probably die in spite of intravenous injections of calcium chloride. On this point Walters was very emphatic, urging that saline solutions and glucose should be given pending the stabilization of the amount of bile pigment in the blood.

He was of opinion that cholecystectomy was the operation of choice when once it was established that there was an infective process in the gall bladder. In capable hands the operation was not more serious than that of removal of the appendix and patients should not be led to believe that it was a desperate measure. The operation was to be preferred to the prolonged administration of "Urotropine."

In conclusion, Dr. Wilkinson emphasized that the physician had not completed his work when the patient was handed over to the surgeon. There still remained the necessity for medical and particularly dietetic supervision.

Dr. JULIAN SMITH congratulated Mr. Newton on his demonstration which he described as facile, informative and interesting. He could not see any detail in which it might have been improved.

With Dr. Wilkinson he hoped that the time would never come when tenderness in the right hypochondrium would result in the removal of the gall bladder by everyone. No one, unless a master of his craft, should undertake this operation alone and unassisted. No operation could be more difficult, although at times it was easy. Mr. Newton had described in graphic manner some of the circumstances which made for great difficulty.

Mr. Newton and Mr. Quick had referred to the recurrence of pain after cholecystectomy. He had resorted to the administration of potassium iodide in these circumstances with a view to promoting the resolution of inflammatory processes and had frequently been pleased with the result. He considered that iodide was well worth a trial before undertaking a second operation.

Like Mr. Newton he had evolved along the line of cholecystectomy in preference to cholecystostomy, but as Mr. Newton had pointed out, if the patient were desperately ill it might be wise to do no more than drain the gall bladder.

In discussing points in operative technique Dr. Smith said that he had tried all the incisions of which he had heard. He condemned Perthes's incision which he had used on four patients in succession and then abandoned. Although this incision allowed an excellent approach to the gall bladder and ducts, all the patients to whom he had referred developed incisional hernia.

Dr. Smith described in detail the incision which he had adopted and proceeded to describe the technique he employed for the removal of the gall bladder. He had never performed the operation without taking hold of the fundus with a clamp and using the gall bladder as a tractor upon the liver. It was rarely that he experienced difficulty in separating the gall bladder from the liver and he retained the viscus as a tractor throughout. He found this method of operating easier than that described by Mr. Newton. He emphasized the necessity for a capable assistant and it was his practice to ask his assistant to make from his position a left handed palpation of the ducts. Stones would sometimes be discovered in this manner. When the clinical history was indicative of a stone in the common bile duct the search should be thorough, patient and persistent. The stone would often be found very far down the duct.

As a rule he would not permit himself to be "nailed down" to a definite diagnosis in dealing with the upper portion of the abdomen, but he took great pains to satisfy himself whether the correct treatment was medical or surgical. He believed in a thorough acquaintance with the viewpoint of the physician as set out by Dr. Wilkinson.

In reply to Dr. Wilkinson Mr. Quick said that he understood Walters's view to be that operation should not be undertaken when the Van den Bergh test revealed the bilirubin content of the blood to be increasing. He made no objection to operation when the amount of bilirubin was diminishing.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held in conjunction with the Melbourne Pædiatric Society at the Children's Hospital, Melbourne, on November 17, 1926. Demonstrations were given by the members of the honorary staff of the hospital.

Malignant Tumour of the Kidney.

Dr. H. DOUGLAS STEPHENS showed a boy, aged three years, who when first observed at the age of twenty-two months had presented a swelling in the left lumbar region. The clinical diagnosis of malignant disease of the kidney had been confirmed by operation at which a very large tumour was removed. The pathological report had been to the effect that the growth was an example of Wilms's tumour. Six months later a swelling had appeared in the left testis and this when removed was described in a pathological report as having the same microscopical structure as the tumour of the kidney. The boy had been given altogether eight applications of deep X ray therapy to the abdomen at intervals of one month. He had been seen at frequent intervals since the second operation and had remained apparently free from recurrence until one month previously when he became ill with what was at first thought to be broncho-pneumonia. On closer investigation and radiological examination it had been determined that the lesions in the lungs were of the nature of widely distributed malignant metastases.

Dr. Stephens exhibited the radiogram. He suggested that it was possibly because of the application of deep X ray therapy to the abdomen that no recurrence had developed in the neighbourhood of the primary growth, whereas the chest, not so treated was affected.

Fracture of the Humerus.

Dr. Stephens's second patient was a girl, aged ten years, who had been brought to hospital two days after an accident by which she sustained a fracture of the humerus at a point four centimetres below the surgical neck. With the aid of general anaesthesia an attempt had been made before the patient's admission to correct the deformity occasioned by the fracture, but the fragments had still been in bad position and the limb was shortened by four centimetres. A second attempt in hospital had been no more successful. Dr. Stephens had decided upon an open operation and after exposing the shaft of the bone had manipulated the fragments into position; the bone was not sutured or plated; the muscles were loosely drawn together by means of catgut sutures after which the limb was maintained in extension in a Thomas splint for fourteen days. At the end of this period the limb had been slung by the side. It was demonstrated that union in perfect position had occurred and the result both functionally and anatomically was excellent.

Dr. Stephens advocated a more extensive use of open operation in fractures of this type in which simple manipulation alone did not appear to result in satisfactory apposition of the fragments. He did not consider silver wires or plates necessary in dealing with such a fracture and rarely employed them.

Psoas Abscess.

Dr. Stephens's third patient was a boy, aged seven years. He had been brought to hospital by his mother who stated that she had just observed for the first time a swelling in the left loin. Physical examination disclosed the presence of a fluctuant swelling in the left lumbar region and a similar swelling in the left inguinal region. These were regarded as typical lumbar and psoas abscesses and it was apparent that they communicated with each other, but there were no signs or symptoms suggestive of their origin. The boy complained of no pain and exhibited no limitation of movement in the spine or hip joints and several radiograms had failed to reveal any lesion in the spine, sacro-iliac articulations or hip joints. The abdomen, however, was full, hard and difficult to examine and it was considered probable that tuberculous peritonitis existed. The urine manifested no abnormality. The origin of the abscesses were uncertain, but Dr. Stephens regarded them as probably due to tuberculous affection of the spine, although there was a lack of positive evidence.

Congenital Malformations.

Dr. Stephens also showed a number of children suffering from various congenital malformations.

One was a girl aged four years who was affected by double congenital dislocation of the hips and bilateral absence of the radii. This child's mother displayed syndactylism in one hand and macrodactylism in the other.

Hare-lip and cleft palate were exemplified by a number of children. In some, operation had not yet been undertaken; in others operations had been performed, but the sutures had not yet been removed; in others the final result of the operation was illustrated.

Pes Cavus.

Mr. MERVYN STEWART showed a number of children chosen to illustrate the results of operation for *pes cavus*. In some the deformity was idiopathic, in others secondary to equinus deformity consequent on poliomyelitis or congenital spastic paralysis.

The operation performed was uniform throughout the series. After the application of a tourniquet, the soft tissues, including the horizontal portion of the plantar fascia and the short muscles of the sole, were stripped off the *os calcis* through an incision on the lateral aspect. Through the same incision the long and short plantar ligaments and the interosseous calcaneo-cuboid ligament were divided. Through an incision on the medial side and working right across to the lateral side the operator proceeded to divide all the vertical prolongations of the plantar fascia which passed from the horizontal portion up to the bones. In so doing it was necessary to keep close to the bones in order to avoid the long flexor muscles and the vessels and nerves. The wounds were closed with sutures of silkworm gut and dressings and plaster applied. The plaster was allowed to set before the tourniquet was released.

There was very little postoperative pain and the children were permitted to walk in the plaster from the fifth day after the operation. Sutures were removed when the plaster disintegrated, usually about five weeks after the operation. No difficulty had been experienced in the healing of the wounds. Exercises were necessary to prevent recurrence of the deformity.

Arthrodesis of the Shoulder Joint.

Mr. Stewart showed a child on whom he had performed arthrodesis of the shoulder joint on account of paralysis of the scapulo-humeral muscles occasioned by poliomyelitis seven years previously.

Brodie's Abscess.

A child, aged five years, furnished an example of Brodie's abscess. The clinical features had been suggestive of tuberculosis, but a diagnosis of Brodie's abscess had been made on the radiogram. A good result had followed curetting the abscess cavity, the introduction of bismuth-iodoform paste and closure of the wound.

Suppurative Arthritis.

Mr. Stewart showed a child, aged three years, in order to illustrate the beneficial results which might sometimes be obtained by early operation in suppurative arthritis. After recovering from pneumonia, empyema and osteomyelitis of the tibia this child had been affected by suppurative arthritis and pathological dislocation of the hip joint. At the time of the operation a prognosis of ankylosis had been given, but at the time of demonstration twelve months afterwards, a perfectly functioning joint was the result.

Parotid Swelling.

Mr. Stewart also showed a patient suffering from a parotid swelling of two months' duration with involvement of the submaxillary salivary gland and facial nerve paresis. The condition was regarded by those present as probably inflammatory in nature, but the possibility of neoplasm could not be excluded.

The Use of Tuberculin in Diagnosis.

Dr. H. BOYD GRAHAM presented three children to illustrate the use of subcutaneous injections of tuberculin in diagnosis. The routine followed was to administer a series of injections, the first consisting of one cubic centimetre of a one in a thousand dilution of Koch's original tuberculin. The second, third and fourth injections were made with five cubic centimetres of one in a thousand dilution, one cubic centimetre of one in a hundred dilution and five cubic centimetres of one in a hundred dilution respectively.

The rectal temperature was recorded at intervals of two hours by day and every four hours by night, the patient being at rest in bed.

The first child shown, a girl, aged eleven years, had given a reaction to the tests. She had undergone tonsillectomy five months previously as her tonsils were considered unhealthy. Until that time she had been in good health, but two weeks afterwards she had suddenly become ill with left-sided apical lobar pneumonia. Five days later physical signs had been present indicating a similar process in the apical portion of the right lung. The pneumonic consolidation of the upper lobe of the left lung had resolved satisfactorily, but the signs of the affection of the right lung persisted for three months. The girl had been febrile and very ill throughout the month of July, but her general condition improved considerably during August, though the physical signs of consolidation were detectable with ease over a large area on both anterior and posterior aspects of the right side of the chest.

At the time of the patient's admission to the Children's Hospital in September her temperature had remained at a normal level for one week, as it did for the first week of her stay in hospital. At 10 a.m. on September 10 she had been given the first of the series of injections already detailed and by 6 p.m. on the following day her temperature had risen to 38.3° C. (101° F.) and the pulse rate from 92 to 140 per minute. Four hours later the temperature had fallen to normal and remained at this level. A local reaction had occurred, but on account of the extent of the affected area it was impossible to determine whether a focal reaction had been induced by this small dose.

At 10 a.m. on September 13 she had received her second injection (five cubic centimetres of a one in a thousand dilution of old tuberculin) and at noon on the following day her temperature was recorded as 39.3° C. (101.8° F.), the pulse rate being 124 per minute. The temperature remained elevated for four hours, but in eight hours had returned to normal there being no further rise.

No more injections had been given because the evidence obtained was regarded as satisfactory and it was considered that the next injection was likely to produce an even more pronounced reaction and might possibly prove harmful by activating the focus of infection.

During the patient's stay in hospital investigation had shown that the heart was not displaced and there were no adventitious breath sounds. No evidence of syphilis or hydatid disease had been forthcoming on the application of the Wassermann test to the blood serum and of the Casoni intradermal test. A radiogram taken early in September had revealed impaired translucency over the whole of the upper lobe of the right lung; this had been interpreted as indicative of consolidation of the pulmonary tissue in this situation. Sputum had been scanty and no tubercle bacilli could be discovered in a Ziehl-Neelsen preparation. A leucocyte count of 29,00 per cubic millimetre was the highest recorded. The chest had not been explored with a needle at any stage.

On November 2 physical examination had shown that relative dullness, diminished vesicular murmur and prolongation of expiration of the bronchial type were still present below the right clavicle. Posteriorly paravertebral dullness on both sides and fine crepitations in the interscapular area was noted. D'Espine's sign could be elicited down to the level of the seventh thoracic vertebra.

Another radiogram had been secured and by comparison with the former indicated that a great measure of resolution of the pneumonic process had occurred. Both films showed excessive marking compatible with a moderate degree of widespread mild tuberculous infiltration.

In reviewing this patient's condition Dr. Graham submitted that there was evidence suggestive of a tuberculous factor, but he regarded the main lesion as an example of delayed resolution of a pneumococcal consolidation.

The second child presented by Dr. Graham was brought forward in order to illustrate when tuberculin should not be used in diagnosis. She came of a tuberculous family and had had a productive cough for six months, during which time she exhibited anorexia, lassitude and failure to thrive. Radiograms strongly suggested adeno-pulmonary tuberculosis and under observation in hospital the child's evening temperature had always been in the neighbour-

hood of 37.8° C. (100° F.). Until the temperature declined and became stable the interpretation of any reaction to the injection of tuberculin would be equivocal; further, the injection was likely to do harm at the site of the disease.

Dr. Graham's third patient was chosen to emphasize the importance of failure to react to subcutaneous injections of old tuberculin. The clinical notes were presented in great detail and the point made by Dr. Graham was that failure to react to injections of old tuberculin on the part of the patient led him to institute investigations which established the correct diagnosis of hydatid disease of the lung when it would not have been anticipated from the clinical history, physical or radiological examinations.

Dr. Graham remarked that it seemed to him to be quite reasonable that the parents of a child should expect a doctor to be able to say whether the child were tuberculous and that instead of being indefinite the medical man should subject the child to a course of diagnostic injections of old tuberculin. Failure to react on the part of a child who was not obviously tuberculous, was of extreme importance in excluding suspected early tuberculous disease in hip, knee or spine and furnished adequate grounds for reassurance in the case of a child who suffered frequent colds or failed to thrive.

If, on the other hand, a reaction were obtained, it indicated at least that the child had been infected and warranted every possible precautionary measure.

Congenital Syphilis.

DR. ROBERT SOUTHEY illustrated from a series of patients the results of the treatment of syphilis in children. He classified the patients according to several clinical types.

Congenital syphilis might be (i.) early or florid, (ii.) latent, (iii.) unsuspected. In the early or florid type the disease became manifest during the first few months of life with obvious signs such as snuffles, rash, enlarged spleen, dilated scalp veins, mild hydrocephalus, superficial ulceration at muco-cutaneous junctions from which treponemata could often be recovered. Other manifestations at this period were desquamation of the palms and soles, suppurative onychia affecting many nails, and pseudo-paralysis due to syphilitic osteochondritis. In the latent group the children were apparently healthy for several years and showed no stigmata until they were six or eight years of age or even older. Sometimes at puberty the condition became obvious through the development of interstitial keratitis, perforating ulcers of the palate, laryngitis, bony changes such as gross periostitis or even gumma formation and occasionally chronic enlargement of the cervical glands which might break down and give rise to a typical gummatous ulcer. Sudden onset of deafness for no apparent reason and Hutchinsonian teeth were also observed in syphilitic children in this group. In the group of children suffering from unsuspected syphilis the patients presented no signs or symptoms whatever and the taint was discovered in the course of the routine application of the Wassermann test to the members of a family of which one had shown definite signs and had been proved to be a congenital syphilitic. Acquired syphilis was very uncommon in children; the disease might, however, be contracted from criminal assault or contact with infected articles or utensils.

Patients from each of these groups were shown and from their treatment charts it was clearly demonstrated that those in the first group responded most rapidly and most satisfactorily to the antisyphilitic treatment. Children classified in the "latent" group were most refractory and as a rule required many courses of injections before they passed the serological test. Those in the "unsuspected" and "acquired" groups were intermediate in respect to the amount of treatment required.

The principal substances used for treatment were "Bismol," an oily suspension of bismuth hydroxide which was administered intramuscularly, and "Sulfarsenol," a watery solution of an arsenical derivative also given by intramuscular injection. It had been a matter of great interest to compare the results obtained with these two preparations. For further comparison Dr. H. Boyd Graham had kindly supplied a number of case histories of patients who had been treated successfully with "Novarsenobillon."

Dr. Southby tabulated his conclusions in the following way:

(i.) "Bismol," "Sulfarsenol" and "Novarsenobillon" are each quite reliable for the treatment of syphilis in children. This has been shown both by clinical improvement and serological confirmation.

(ii.) Arsenical preparations act more rapidly than bismuth derivatives.

(iii.) The local reaction to "Sulfarsenol" and "Bismol" is negligible, but in a small percentage of those treated with "Novarsenobillon" local reaction takes the form of chemical abscess formation and sloughing.

(iv.) There is no tendency to relapse if the initial treatment has been intensive and the patient has manifested good clinical and serological response.

(v.) Children tolerate quite large doses (in many cases the same amount as the usual adult dose) of arsenic and bismuth without any ill-effects.

(vi.) In some of the more obstinate cases the response to bismuth therapy seems to be more satisfactory than that obtained with the arsenical derivatives.

Three of the patients were of particular interest:

The first was an infant of three months of age, a premature baby of four and a half pounds weight at birth and he was suffering from one of the most severe forms of florid congenital syphilis ever seen in the clinic. In addition the infant was suffering from a very large inguinal hernia which was constantly coming down and was reduced always with great difficulty. This child had been desperately ill when brought to the hospital and an injection of thirty centigrammes of "Sulfarsenol" (a very large dose for an infant) was given on the first day. The response had been almost dramatic. Within a week the snuffles and superficial ulceration had completely disappeared, the baby was taking its feedings very much better and a gain in weight was registered. Two days after the second injection of "Sulfarsenol" (fifteen centigrammes) the hernia had become strangulated and immediate operation was imperative. Excellent recovery had followed the operation and though still having injections, the child looked extremely well. Dr. Southby considered that it was solely the intensive arsenical treatment which had saved the child's life and had enabled it to withstand the serious operation.

A girl, aged six years, had suffered from a large swelling of the upper deep cervical glands of the right side of the neck for a period of three months. When the child was first seen at the hospital the mass had been on the point of ulcerating through the skin and shortly afterwards there formed a large, deep, typical gummatous ulcer which exposed a considerable portion of the body of the mandible and the deeper structures of the neck. A strong reaction to the Wassermann test had been obtained with this patient's serum. She was treated with "Sulfarsenol" injections and potassium iodide by the mouth and although the first course of treatment had not been completed, the whole of the large ulcerated area had healed, an extensive cicatrix occupying the right submaxillary and upper cervical regions. Dr. Southby said that he showed this patient on account of the rarity of such a lesion in a young child and the excellent response to antisyphilitic treatment.

The third patient was a female child who had contracted syphilis at the same time as she had been infected with gonorrhoeal vulvo-vaginitis. This child, only eight years of age, had presented all the characteristic features of virulent secondary syphilis as seen in adults, namely, generalized maculo-papular rash, alopecia, mucous patches on palate and pharynx, well defined ulcer on the right tonsil and enlarged epitrochlear glands. She had reacted very well to "Bismol" injections and had been free from symptoms and had yielded no serological reactions for nine months.

Dr. Southby also showed a number of babies to illustrate the benefits following intensive treatment of the mother in the early months of pregnancy. The mothers had all commenced treatment in the first two or three months of pregnancy and in each instance a full-time living child was born. The infants had shown no stigmata and their sera had given no reaction to the Wassermann test for periods up to two years.

Dr. Southby concluded with a demonstration of a large series of skiagrams of bone lesions in congenitally syphilitic children. Films illustrating the early osteochondritis or "epiphysitis" and the later periostitis and gummatous destruction were included.

Another series of X ray films showed the rate of absorption of an intramuscular injection of two cubic centimetres of "Bismol." The first, taken immediately after the injection, showed a large shadow in the region of the buttock. Three days later the greater part of the "Bismol" had disappeared, but some traces persisted for six weeks afterwards. In spite of this slow absorption of the residuum of the injection numbers of infants had been given ten or twenty doses at weekly intervals without any sign of bismuth intoxication or any cumulative action of bismuth stored up in a large intramuscular depot.

Mental Deficiency.

Dr. A. P. DERHAM showed a number of patients selected to illustrate association of congenital syphilis and mental deficiency. All were boys of age ranging from six to fourteen years. The sixteen patients were considered in four groups.

The first group was one in which syphilis was discovered by routine serological examination or in which the Wassermann test was carried out on account of suggestive signs in other members of the family.

The second group included several who exhibited clinical signs of congenital syphilis, the clinical diagnosis having been confirmed by the application of the Wassermann test to the blood of the patient and/or members of his family.

The third group comprised a number who displayed clinical features suggestive of syphilis, but in whom diagnosis had not been confirmed by the result of the Wassermann test.

The fourth was a group of children in whom mental deficiency was associated with physical disease other than syphilis.

Dr. GEOFFREY A. PENNINGTON demonstrated the method of examination recommended and practised by Professor R. J. A. Berry at the Psychiatric Clinic at the Children's Hospital.

The method was based on the recognition of the importance of the neurones as the basis of the mind and although the use of instrumental methods of measurement was necessary for accurate physical mensuration, a sound knowledge of the structure and functions of the nervous system was essential for the correlation of the tests with the clinical findings.

The routine followed was the calculation of brain capacity from measurements of head length, breadth and height; the determination of standing and sitting stature and body weight; vital capacity and the degree of application of purposive coordinated effort.

The brain capacity did not indicate in any way whether variations from the normal were due to alteration in the number of neural or glial elements or the quantity of fluid. Any departure from the normal, especially if associated with disparity between the brain capacity and physical or psycho-physical measurements, indicated the necessity for a careful investigation of mentality.

Intelligence tests were also performed in each case. The Stanford modification of the Binet-Simon tests and the Porteus maze tests were largely employed, but not to the exclusion of other methods of testing. In no case was reliance placed on a single test or measurement, but all the findings were correlated and considered together.

By comparing these results with percentile tables an accurate estimation of the degree of physical and mental development was possible and the findings were considered in conjunction with the data obtained from a full clinical history and a careful general medical examination.

If any abnormal development of the nervous system appeared, an attempt was made to elucidate and treat the cause which was nearly always found to have a physical basis.

A number of patients were shown. They illustrated amentia associated with varying degrees of apparent congenital deficiency of neurones, the destructive effects of *encephalitis lethargica*, toxæmias and infectious diseases, the inhibitory influence of disturbance of the balance or

activity of the endocrine glands, general malnutrition, epilepsy and environment.

Environment was shown to play an important part in the development of pathways for nerve impulses or reflex arcs with cortical connexions. Thus in some inhibition of wrongful impulses was well developed, even though a relative paucity of neurones existed, while in others with harmful environment the converse held. Very seldom, however, was it found that environmental influences were the sole cause of delinquent tendencies.

A child was shown to demonstrate the futility of attempting to improve cortical control of paresed limbs by means of sympathetic ramisectomy. The child had been left with hemiplegia after an attack of encephalitis in which the cerebral cortex was severely affected.

Congenital Cataract.

DR. DOUGLAS GALBRAITH showed a baby, aged three months, suffering from congenital cataract. No evidence of syphilis had been obtained by the application of the Wassermann test to the infant's serum. Dr. Mark Gardner proposed to "needle" the cataract when the baby's health had improved.

Bronchiectasis.

Dr. Galbraith's second patient was a girl, aged six years, affected with bronchiectasis which followed attacks of pneumonia at ten months, two, three and four years of age. The sputum was becoming offensive and the radiogram showed the characteristic "honeycomb" appearance of bronchiectasis. It was hoped to employ "Lipiodol" in the treatment of this patient.

Schlatter's Disease.

Schlatter's disease was illustrated in a third patient shown by Dr. Galbraith, a boy, aged fourteen years, who had complained of swelling and soreness below the right knee for the previous eighteen months. Lateral movement could be felt in the detached tuberosity of the tibia and the radiographic appearance was characteristic. With reference to treatment Dr. Galbraith said that the consensus of surgical opinion seemed to be that the limb with the knee joint in a position of extension should be placed in a plaster of Paris casing which reached from the thigh to the ankle. Moderate exercise might be allowed.

Exophthalmic Goitre.

Dr. Galbraith also discussed the condition of a girl, aged fourteen years, who had exhibited enlargement of the right half of the thyroid gland for a period of six months. It was stated that the girl had been very "nervous" from birth and that two half-sisters had manifested signs of goitre after emotional disturbances. All were daughters of the same mother. In the patient under discussion menstruation had commenced at the age of twelve and a half years and had been regular in its incidence. She displayed exophthalmos, tremor, tachycardia and nervousness. The basal metabolic rate had been estimated as -2.5. Her weight was 58.6 kilograms (nine stone three pounds). After the administration of five drops of Lugol's solution thrice daily for ten days considerable improvement in the nervous symptoms had been noted and the pulse rate had moderated from 135 per minute to 96. There had been a gain in weight of two kilograms during the last month, but the exophthalmos and enlargement of the thyroid had remained unaltered. The low metabolic rate and gain in weight were unusual features in an otherwise well defined exophthalmic goitre syndrome.

Cerebro-Spinal Meningitis.

DR. D. M. EMBELTON showed a number of children who had recovered from cerebro-spinal meningitis and reviewed the mortality and serum treatment of the patients admitted to the Children's Hospital suffering from this disease during the previous two years. All the infections had been established bacteriologically as meningococcal in nature. Most of the children who had recovered, had been recently examined and all appeared well except two, one child being completely deaf and the other having lost the sight of an eye from complicating panophthalmitis.

During the twelve months 1924-1925 there had been twenty children admitted to hospital with acute purulent cerebro-spinal meningitis; four had recovered. In 1925 to 1926 there had been twenty-four admissions from the same cause and ten of the children had recovered.

An analysis of the case records indicated that in the early stages of the disease the administration of anti-meningococcal serum by intrathecal, intravenous and subcutaneous routes had materially assisted in those children who had recovered. Cisternal puncture had been resorted to when lumbar puncture was ineffective. As a general rule serum was given daily until a definite improvement in the temperature and clinical signs took place.

Cretinism.

Dr. Embelton also showed a cretin, aged eighteen months. At the age of eight months the baby had been unable to sit up, was very fat, constipated and displayed a large umbilical hernia. A loud systolic bruit was audible at the apex of the heart. The infant had at that time been fed naturally with some supplementary "Lactogen" and his weight was 7.5 kilograms. An immediate response had followed the institution of treatment by extract of thyroid gland in doses of 0.03 gramme (half a grain) twice daily.

Dr. Embelton gave detailed progress notes of the gain in weight and of the quantities of thyroid extract administered. At the time of demonstration, his age being eighteen months, the child was walking alone and weighed 11.5 kilograms. He could say single words, took his food well and slept well. He was good tempered in contrast with former irritability. He was receiving 0.24 gramme (four grains) of thyroid extract daily.

Familial and Latent Rheumatism.

Dr. Embelton also discussed a number of children whom he regarded as the subjects of familial and latent rheumatism and reviewed the case record of a child who had died from Henoch's purpura.

Vascular Nævi.

DR. JOHN H. KELLY showed several babies to illustrate the results obtained in the treatment of vascular nævi by means of radium. He advocated the use of radium as the optimum method of treatment; it was entirely painless and did not occasion any breach of surface. The nævi faded and diminished in size rapidly during the course of a series of short radium applications. In certain situations such as the margin of the eyelid radium was especially indicated. Nævi in the vicinity of the napkin area were best treated by radium.

Dr. Kelly showed a baby, aged five months, in whom a raised angioma of large size and great depth was situated over the middle portion of the sternum. This tumour was not amenable to surgical removal, but was obviously responding to radium.

Alopecia Areata.

Several patients with partial and complete alopecia were next demonstrated. Dr. Kelly remarked that such children were often of a nervous temperament. Any source of irritation in the distribution of the trigeminal nerve should be rectified. Painting with silver nitrate solution and exposure to sunlight darkened the bald areas. One child with alopecia universalis had responded well to ultraviolet light therapy.

Urticaria Papulosa.

A child exhibiting urticaria papulosa in characteristic form was shown by Dr. Kelly to illustrate the distribution of the lesions. The outer sides of the arms and legs were predominantly affected. Infection and crusting followed the scratching of the papules. The distribution was contrasted with that of the lesions of scabies, in which the burrows of the parasite and the linear scratch marks tended to a flexural distribution with the napkin area free from lesions.

Epidermolysis Bullosa.

Dr. Kelly's next patient was a boy, aged ten years, who since birth had been prone to the development of large

blisters over bony prominences as the result of the slightest trauma. The elbows, knees and knuckles showed much scarring and there were fresh bullæ on some of the fingers. It was pointed out that this condition, *epidermolysis bullosa*, was a rare congenital anomaly which sometimes improved in the adolescent stage, but often remained as a crippling affliction throughout life. Treatment was palliative and directed towards prevention of infection of the lesions.

Linear Nævus.

Dr. Kelly next showed a boy, aged twelve years, and demonstrated a number of linear streaks of hard, warty excrescences in the skin. Such were present on the abdominal wall, scrotum and penis and also on the lower limbs; they appeared at the age of one year. Should any of the warty masses be accidentally knocked off they soon reappeared. Radium had been successfully employed for the permanent removal of a troublesome area between the buttocks.

Primary Optic Atrophy of Unknown Origin.

Dr. H. LAWRENCE STOKES invited discussion on the condition of a baby, aged ten months. The infant had displayed *icterus neonatorum* and had failed to thrive for the first few weeks of life. He had contracted bronchopneumonia when three months old and whooping cough one month later. When he was six months old, a degree of head sweating and irritability had been noted. At this time there was found to be slight enlargement of the radial epiphyses, but there had been no radiological evidence of rickets. During the previous few months the infant had been protruding his tongue more than was normal. He had been breast fed for five months after which he was given cow's milk diluted with water and a certain amount of condensed milk. A few weeks prior to the meeting the parents had thought that the infant did not appear to notice them. The ocular fundi had been examined and a condition of primary optic atrophy was discovered. A general physical and neurological examination revealed nothing abnormal and no pathological features could be detected in a radiogram of the skull. No evidence of familial syphilis had been obtained when the blood serum of the infant, mother and sister were examined by the Wassermann test.

Muscular Dystrophy.

Dr. Stokes also showed a girl, aged eleven and a half years, whom he regarded as the subject of the facio-scapulo-humeral type of muscular dystrophy of Landouzy-Déjérine. The patient had been quite well until the age of four years, at which stage she developed asthma and bronchitis. Since that time she had suffered from many similar attacks. One or two occasions there had been slight hæmoptysis. A radiogram of the chest was interpreted as indicating a certain amount of fibrosis of the lung, but there did not appear to be any active tuberculous foci. No tubercle bacilli had at any time been found in the sputum. Complement fixation tests in respect of both syphilis and hydatid had yielded no reactions.

When the child was five years old, the mother had noticed that her face appeared thin and also that her upper lip did not move when she smiled. A little later the lower lip was observed to be dropped at times and saliva tended to dribble from the angles of the mouth. This condition had persisted with apparently little change until a few weeks prior to the meeting when the right shoulder was noticed to be lower than the left and the shoulder blades prominent.

The child was seen to have an expressionless, thin face. There was no wrinkling of the muscles of the forehead, no upward movement of the angles of the mouth on smiling and the muscles of the eyelids were very weak. The scapulæ were definitely "winged," especially that of the right side and the upper limbs could not be abducted beyond the horizontal position. Sensation was unimpaired. All the affected muscles showed a weak response to faradism.

There were three other children in the family, two girls and a boy. The girls had been examined and showed no evidence of muscular dystrophy.

Infantile Dietetics.

Dr. LIONEL HOOD discussed principles of dietetic management of infants, basing his remarks on the problems presented by a number of babies from the wards of the hospital.

Cretinism.

Dr. J. W. GRIEVE showed a number of children affected with cretinism and also a child with oxycephaly and a patient exhibiting lipodystrophia.

Poliomyelitis.

Dr. JEAN MACNAMARA showed a number of children who had contracted poliomyelitis within recent months and discussed in detail the measures adopted for the treatment with immune serum from human sources.

Pathological Specimens.

Dr. REGINALD WEBSTER demonstrated from a large number of museum specimens excellently mounted in natural colours and detailed the technique adopted in their preparation.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been elected a member of the Victorian Branch of the British Medical Association:

Hurley, Joseph James, M.B., B.S., 1925 (Univ. Melbourne), East St. Kilda.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Jabour, Louis, M.B., Ch.M., 1926 (Univ. Sydney), Lakemba and Alice Streets, Lakemba.

Potiris, Michael, M.B., Ch.M., 1926 (Univ. Sydney), 70, Cook Road, Centennial Park.

Shappere, Arthur Joseph, M.B., Ch.M., 1926 (Univ. Sydney), Hilltop Crescent, Manly.

Staples, Eric Hope, M.B., Ch.M., 1926 (Univ. Sydney), Bundarra Road, Bellevue Hill.

Worrall, Ralph Lyndal, M.B., Ch.M., 1926 (Univ. Sydney), Birtley Place, Elizabeth Bay.

THE COLLEGE OF SURGEONS OF AUSTRALASIA.

THE temporary Honorary Secretary of the College of Surgeons of Australasia addressed on December 2, 1926, ballot papers for the election of the members of the Council of the College to the forty founders. Three founders in New Zealand and four founders in New South Wales have failed to return their ballot papers. As the ballot papers are returned unsigned, the names of those who have failed to record their votes are unknown. The seven gentlemen are therefore requested to fill in the marks on the voting papers and to return them to Dr. A. L. Kenny, 13, Collins Street, Melbourne, as soon as possible. The ballot papers will be counted one week after the publication of this notice, namely on January 22, 1927.

CORRIGENDUM.

IN the issue of December 25, 1926, page 861, on the left hand column, eight lines from the bottom, the word "ounce" should read "drachm."

THE reference is to the amount of adrenalin used by Dr. Rosenfield as an addition to the Schleich's solution. The amount is 1.66 mls to one hundred cubic centimetres which is equivalent to one minim to the drachm.

NEW YEAR HONOURS.

THE list of the recipients of New Year honours contains the names of two medical practitioners. Dr. Henry Head who has been created a knight bachelor, needs no intro-

duction to the members of the medical profession. His original contributions to neurology have gained for him a reputation among the most eminent authorities in this branch of medical science. He is a Fellow of the Royal Society and was editor of *Brain* for many years. Dr. Thomas Houston has also received the honour of knighthood. He is lecturer in medical jurisprudence at Queen's University, Belfast, and holds many hospital appointments in Belfast. He has been a prominent member of the Ulster Medical Society and has recently been its President.

Medical Prizes.

THE ALVARENGA PRIZE.

THE Secretary of the College of Physicians of Philadelphia has circularized the medical press in regard to a mistake in the title of the essay for which the Alvarenga Prize for 1926 was awarded. The correct title is "The Gonophage." The announcement was made in our issue of December 25, 1926, page 877.

Books Received.

- BAILLIÈRE'S SYNTHETIC ANATOMY: A SERIES OF DRAWINGS ON TRANSPARENT SHEETS FOR FACILITATING THE RECONSTRUCTION OF MENTAL PICTURES OF THE HUMAN BODY**, by J. E. Cheesman, Deputy Medical Officer of Health for Leyton, London; 1926. London: Baillière, Tindall and Cox. Price: 2s. 6d. each drawing.
- MEDICAL LABORATORY METHODS AND TESTS**, by Herbert French, M.A., M.D. (Oxon.), F.R.C.P. (London), and Tallent Nuthall, M.D. (London); Fourth Edition; 1926. London: Baillière, Tindall and Cox. Crown 8vo., pp. 256, with illustrations. Price: 7s. 6d. net.
- DISEASES OF THE HEART AND LUNGS: A HANDBOOK FOR NURSES**, by A. I. G. McLaughlin, M.B., Ch.M. (Sydney); 1926. London: Faber and Gwyer, Limited. Crown 8vo., pp. 185, with illustrations. Price: 4s. 6d. net.
- ULTRA-VIOLET RAYS IN GENERAL PRACTICE**, by W. Annandale Troup, M.C., M.B., Ch.B. (St. Andrews); 1926. London: H. K. Lewis and Company, Limited. Demy 8vo., pp. 71, with illustrations. Price: 4s. 6d. net.
- INFECTIONS OF THE HAND**, by Lionel R. Fifield, F.R.C.S. (England); 1926. London: H. K. Lewis and Company, Limited. Crown 8vo., pp. 200, with illustrations. Price: 9s. net.
- A SHORTER SURGERY: A PRACTICAL MANUAL FOR SENIOR STUDENTS**, by R. J. McNeill Love, M.B., M.S. (London), F.R.C.S. (England); 1926. London: H. K. Lewis and Company, Limited. Demy 8vo., pp. 206, with illustrations. Price: 12s. 6d. net.
- A TEXT-BOOK OF MIDWIFERY FOR STUDENTS AND PRACTITIONERS**, by R. W. Johnstone, C.B.E., M.A., M.D., F.R.C.S.E., M.R.C.P.E.; Fifth Edition; 1926. London: A. and C. Black, Limited. Crown 8vo., pp. 536, with illustrations. Price: 15s. net.
- NATIVE DIET WITH NUMEROUS PRACTICAL RECIPES**, by Ettie A. Rout, with Preface by Sir William Arbuthnot Lane, Bart., C.B., M.S.; 1926. London: William Heinemann (Medical Books), Limited. Royal 8vo., pp. 150, with illustrations. Price: 6s. net.
- HIGH BLOOD PRESSURE, ITS VARIATIONS AND CONTROL: A MANUAL FOR PRACTITIONERS**, by J. F. Halls Dally, M.A., M.D., B.Chir. (Cantab.), M.R.C.P. (London); Second Edition; 1926. London: William Heinemann (Medical Books), Limited. Royal 8vo., pp. 212, with illustrations. Price: 12s. 6d. net.
- DENTAL PROSTHETICS**, by J. Douglas Logan, L.D.S. (Edinburgh); Volume IV.; 1926. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 229, with illustrations. Price: 7s. 6d. net.
- DENTAL RADIOGRAPHY**, by Charles A. Clark, L.D.S., R.C.S.; Volume V.; 1926. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 111, with illustrations. Price: 7s. 6d. net.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xx.

ADELAIDE CHILDREN'S HOSPITAL: Medical Superintendent.
SAINT VINCENT'S HOSPITAL, SYDNEY: Registrar.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	Contract Practice Appointments at Ceduna, Murat Bay and other West Coast of South Australia Districts.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia. Yarloop Hospital Fund.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

- JAN. 17.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JAN. 18.—New South Wales Branch, B.M.A.: Ethics Committee.
JAN. 18.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JAN. 18.—Tasmanian Branch, B.M.A.: Council.
JAN. 19.—Western Australian Branch, B.M.A.: Branch.
JAN. 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JAN. 26.—Victorian Branch, B.M.A.: Council.
JAN. 28.—Queensland Branch, B.M.A.: Council.
FEB. 8.—New South Wales Branch, B.M.A.: Ethics Committee.
FEB. 15.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
FEB. 21.—New South Wales Branch, B.M.A.: Organization and Science Committee.

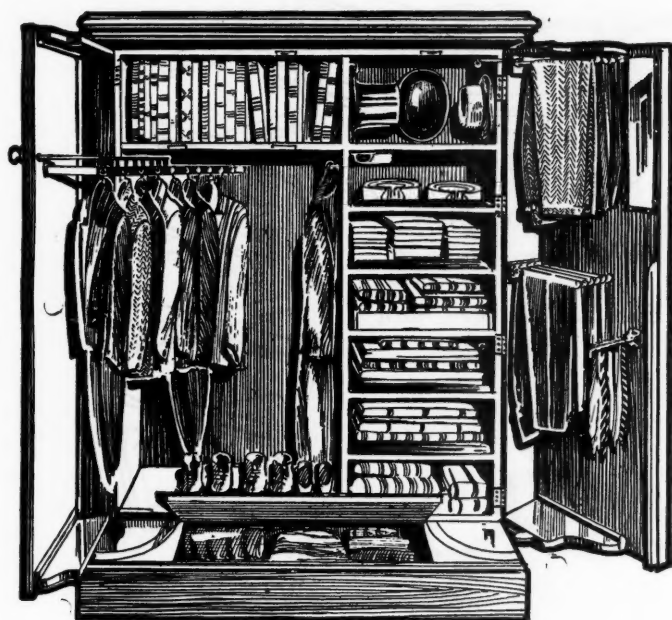
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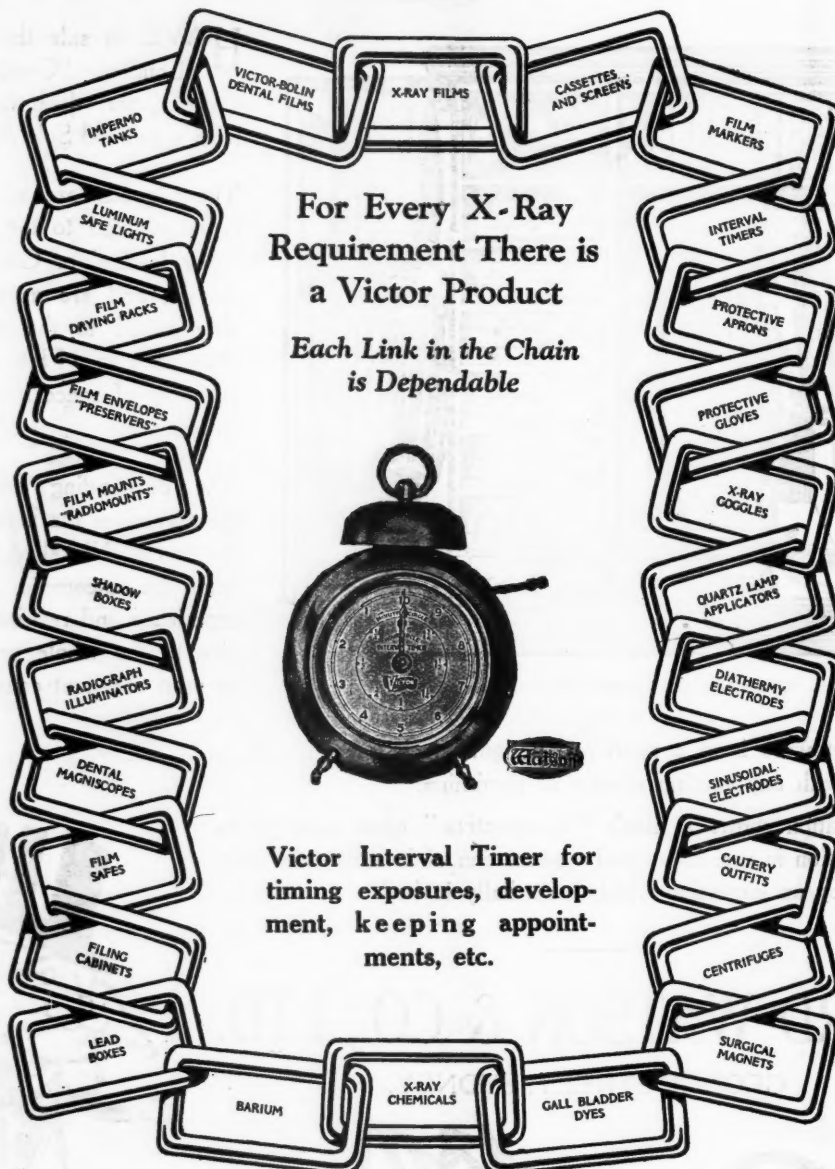
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